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NATIONAL DAM SAFETY PROGRAM. ISCHUA CREEK WATERSHED DAM NUMBER --ETC(U)
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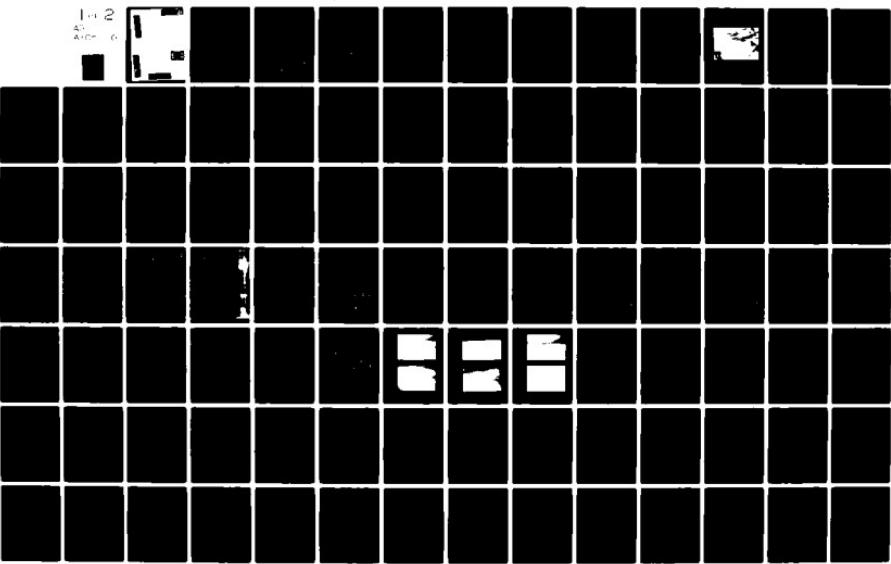
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization. Examination of available documents and visual inspection of the Ischua Creek Watershed Dam No. 5 and appurtenant structures did not reveal conditions which constitute a hazard to human life or property. However, the dam has some deficiencies which require further investigation and remedial action.		

Ponded water was observed on the emergency spillway and the berm on the downstream face of the dam. In addition, sloughing on the upstream slope to the left of the intake structure was observed. It is recommended that these conditions be evaluated further by a qualified registered professional engineer.

Using the Corps of Engineers screening criteria for review of spillway adequacy, it has been determined that the dam would not be overtopped under full PMF conditions. The PMF routed through the reservoir required 58 percent of the spillway outflow capacity. The spillway capacity is, therefore, judged to be adequate.

The investigations recommended should be completed within 12 months of notification to owner, and remedial actions resulting from these investigations completed in the subsequent 12 months.

The following remedial measures should be performed within 1 year of notification to owner:

- Install ladder rungs on the riser to provide access to the drain gate housing.
- Regrade and fill in the erosion gullies on the upstream slope.
- Remove vegetation on the slopes and crest of the embankment and the immediate downstream channel. Provide a program of periodic cutting and mowing of these surfaces.
- Clear debris from the trash racks and upstream slopes periodically.
- Implement a program of periodic inspection and maintenance of the dam and appurtenances including yearly operation and lubrication of the gate system. Document this information for future reference.
- Develop a formal written downstream warning system to alert the appropriate officials and residents in the event of an emergency.

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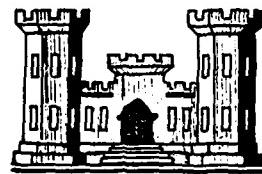
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ALLEGHENY RIVER BASIN

**ISCHUA CREEK WATERSHED
DAM No. 5**

**CATTARAUGUS COUNTY, NEW YORK
INVENTORY No. N.Y. 565**

**PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM**



NEW YORK DISTRICT, CORPS OF ENGINEERS

AUGUST 1981

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PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the Investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I Inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test Flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event a finding that a spillway will not pass the Test Flood should not be interpreted as necessarily posing a highly inadequate condition. The Test Flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

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PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam:	Ischua Creek Watershed Dam No. 5
State Located:	New York
County Located:	Cattaraugus
Basin:	Allegheny River
Date of Inspection:	April 2, 1981

ASSESSMENT

Examination of available documents and visual inspection of the Ischua Creek Watershed Dam No. 5 and appurtenant structures did not reveal conditions which constitute a hazard to human life or property. However, the dam has some deficiencies which require further investigation and remedial action.

Ponded water was observed on the emergency spillway and the berm on the downstream face of the dam. In addition, sloughing on the upstream slope to the left of the intake structure was observed. It is recommended that these conditions be evaluated further by a qualified registered professional engineer.

Using the Corps of Engineers screening criteria for review of spillway adequacy, it has been determined that the dam would not be overtopped under full PMF conditions. The PMF routed through the reservoir required 58 percent of the spillway outflow capacity. The spillway capacity is, therefore, judged to be adequate.

The investigations recommended should be completed within 12 months of notification to owner, and remedial actions resulting from these investigations completed in the subsequent 12 months.

The following remedial measures should be performed within 1 year of notification to owner:

- Install ladder rungs on the riser to provide access to the drain gate housing.
- Regrade and fill in the erosion gullies on the upstream slope.
- Remove vegetation on the slopes and crest of the embankment and the immediate downstream channel. Provide a program of periodic cutting and mowing of these surfaces.
- Clear debris from the trash racks and upstream slopes periodically.
- Implement a program of periodic inspection and maintenance of the dam and appurtenances including yearly operation and lubrication of the gate system. Document this information for future reference.
- Develop a formal written downstream warning system to alert the appropriate officials and residents in the event of an emergency.

Approved by:

Robert J. Farrell
Robert J. Farrell, P.E.
New York No. 55983

Col. W.M. Smith, Jr.
Col. W.M. Smith, Jr.
New York District Engineer

Date:

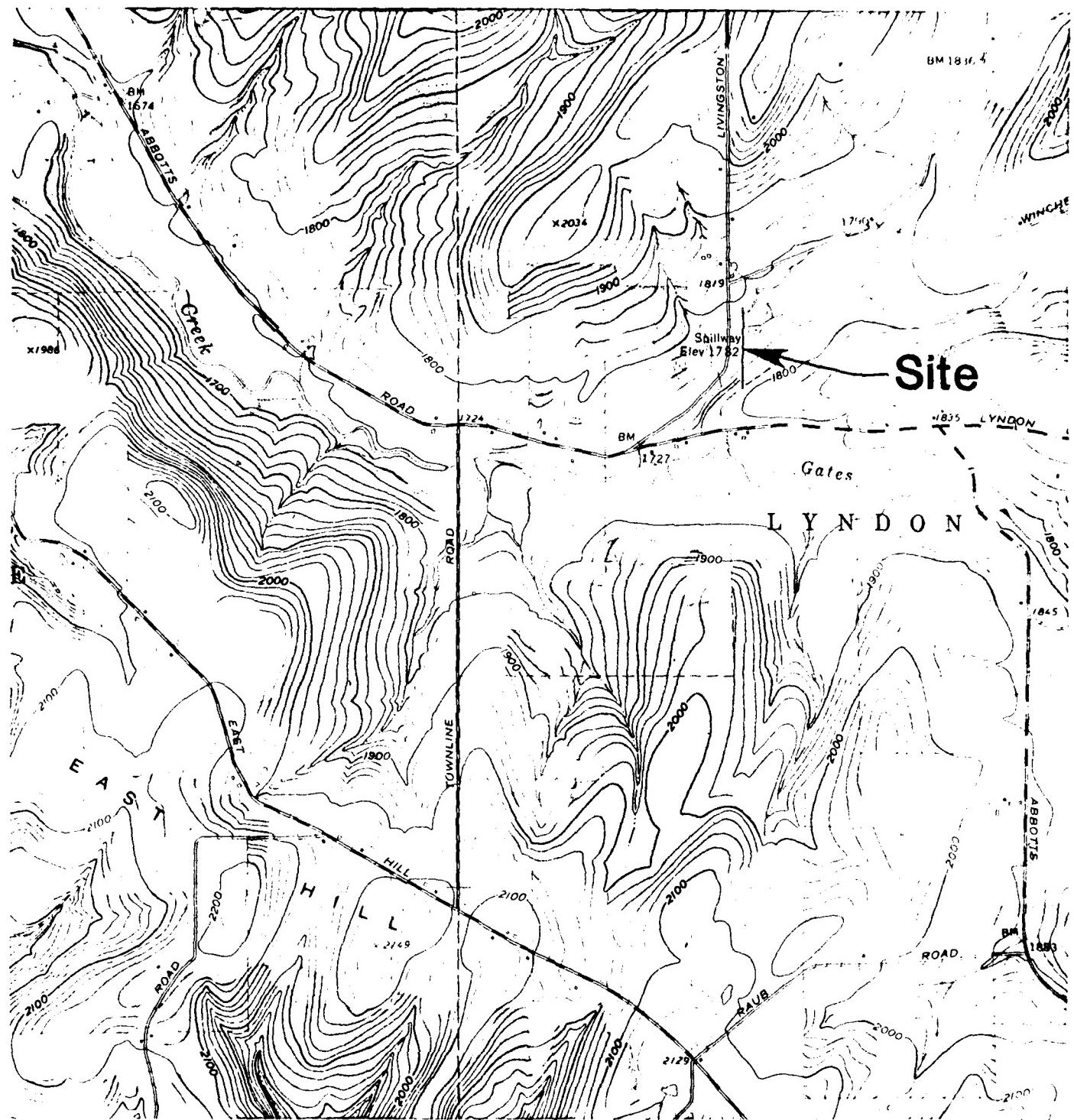
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Ischua Creek Watershed

Dam No. 5



AERIAL VIEW



Ischua Creek Watershed Dam No. 5

LOCATION PLAN

Scale: 1"-2000'

NATIONAL DAM INSPECTION PROGRAM
PHASE I INSPECTION REPORT

ISCHUA CREEK WATERSHED DAM NO. 5

SECTION 1 - PROJECT INFORMATION

1.1 GENERAL

a. Authority

The Phase I Inspection reported herein was authorized by the New York District Corps of Engineers in a letter dated 24 February 1981, in fulfillment of the requirements of the National Dam Inspection Act, Public Law 92-367, dated 8 August 1972.

b. Purpose of Inspection

This inspection was conducted to evaluate the existing conditions of the dam, to identify deficiencies and hazardous conditions, to determine if these deficiencies constitute hazards to life and property, and to recommend remedial measures where required.

1.2 DESCRIPTION OF THE PROJECT

a. Location

The dam is located on a tributary of Gates Creek in the Town of Lyndon, 3.5 miles southeast of Franklinville, New York. It can be reached from Livingston Rd. which intersects Abbotts Rd. out of Franklinville. The dam is shown on U.S.G.S. Franklinville, New York quadrangle with coordinates at N42° 18' 47", W 78° 23' 43" (see location plan). Page B4 of Appendix B is a site plan for this dam.

b. Description of Dam and Appurtenances

The dam consists of a homogeneous earthfill embankment with an earthfill cutoff trench below; a principal spillway with a reinforced concrete riser structure and outlet pipe; and a vegetated earth channel emergency spillway located to the south of the dam embankment. The length of the dam embankment is approximately 1300 ft. The emergency spillway is 350 ft. wide.

1) Dam Embankment

The embankment is constructed of semi-pervious silty sand and gravel. It is approximately 1300 ft. long and a maximum of 54 ft. high.

The upstream slope is 3 horizontal to 1 vertical and the downstream slope is 2.5 horizontal to 1 vertical. The crest width is 18 ft.

There are berms on the upstream and downstream slopes approximately 10 ft. wide. The berm on the upstream slope extends the full length of the dam at elevation 1752.0 ft. (MSL). The berm on the downstream slope varies in elevation over the length of the dam. However, it is approximately at elevation 1770 ft. (MSL).

Beneath the embankment is an earthfill cutoff trench which is 14 ft. wide at the bottom. According to available plans, it is constructed of the same material as the embankment.

The dam is founded on silty sand and gravel (designated GM using the Unified Soil Classification System).

2) Emergency Spillway

The emergency spillway is cut into silty sand and gravel in the south abutment. Diversion berms of compacted fill have been constructed on both sides with side slopes of 3 horizontal to 1 vertical. The grass covered channel curves around the south end of the dam embankment.

The control section is 350 ft. wide and 30 ft. long and the downstream channel is roughly 700 ft. long.

3) Principal Spillway

The principal spillway consists of a reinforced concrete drop inlet structure with a 48 in. diameter reinforced concrete water pipe supported on a concrete cradle, and a stone lined plunge pool.

The inside dimensions of the riser structure are 34.5 ft. high and 12.0 ft. wide normal to the axis of the dam. It is 4.0 ft. long parallel to the embankment and flares to 17.0 ft. at the top. The walls of the structure are 20 in. thick for the bottom 12 ft., 16 in. thick for the next 12 ft., and 12 in. thick for the top section. The structure is founded on a 9.3 ft. by 18.3 ft. spread footing. The "low stage inlet" is an uncontrolled opening 2.0 ft. long and 1.5 ft. high with a crest elevation at 1752.0. It is protected by a trash rack fabricated from galvanized steel angle sections and reinforcing bar.

The "high stage inlet" consists of two openings 33.0 ft. above the invert of the riser. They are 12.0 ft. wide and 1.5 ft. high and are located in the left and right sides of the flared portion of the riser structure. They are protected by four galvanized steel pipes placed in the sloping section below each opening. A 2.0 ft. by 2.0 ft. manhole permits access into the riser structure.

The riser structure is drained by a 48 inch diameter reinforced concrete pressure pipe. It is approximately 316 ft. long and drops approximately 3 ft. over that length. The pipe penetrates the downstream side of the riser structure and is supported by a 12 in. thick reinforced concrete cradle within the embankment. Plans indicate 7 anti-seep collars cast around the pipe within the embankment.

The plunge pool is 28 ft. long parallel to the axis of the outlet pipe and has a base 8 ft. wide with slopes of 2.5 horizontal to 1 vertical rising on both sides. The pool is lined with rip rap 1.5 ft. thick.

4) Reservoir Drain

The reservoir drain consists of a 12 in. diameter bituminous coated corrugated metal (BCCMP) pipe extending 48 ft. upstream from the riser. At the riser is a 12 in. diameter vertical lift gate; it is controlled by a stem extending to the top of the riser and can be operated by a wheel. At the upstream end of the pipe is a 24 in. diameter vertical BCCMP 8 ft. long perforated for the top 6 ft. which acts as the drop inlet.

5) Foundation and Embankment Drainage

A 2 ft. thick blanket drain is located below the downstream slope ; it extends from 40 ft. downstream of the centerline of the dam to the downstream toe of the dam. This drain outlets into a cobble drain which extends along the downstream toe and drains into the outlet channel.

c. Size Classification

The dam's height of 54 ft. places it in the INTERMEDIATE size category according to the Corps of Engineers Recommended Guidelines.

d. Hazard Classification

The hazard potential classification for this dam is HIGH because of the significant economic losses and high potential for loss of life downstream in the event of dam failure. Section 5 of this report presents more detailed discussion of the hazard potential.

e. Ownership

The dam is owned and operated by:

Cattaraugus County
James M. Cash, Chairman of Oversight Committee
RD #2
Maple Grove Road
Franklinville, New York 14737
Tele: (716) 767-3604

f. Purpose of Dam

The purpose of this dam is to reduce downstream flooding by providing temporary storage for the runoff from 4,096 acres. The temporary storage is released gradually through the two-stage principal spillway system.

g. Design and Construction History

The dam was built under the Watershed Protection and Flood Prevention Act by the Ischua Creek County Small Watershed Protection District with the assistance of the Soil Conservation Service. It was completed in 1961.

h. Normal Operating Procedures

The dam is normally self-regulating.

1.3 Pertinent Data

a. Drainage Area

The drainage area for this dam covers 6.4 square miles. It is made up primarily of rolling pasture and woodland and minor development.

b. Discharge at Dam Site

1) Outlet Works

Normal discharge at the site is through the 48 in. diameter outlet pipe. In the event of severe flooding, water would flow over the emergency spillway at elevation 1782.0 ft. (MSL). The invert of the low stage orifice is at elevation 1752.0 ft. (MSL). The invert of the high stage orifice is at elevation 1772.0 ft. (MSL)

2) Maximum Known Flood

There is no data available for the maximum known flood at dam site. Recent high water was observed at elevation 1769.7 ft. (MSL).

3) Ungated Spillway Capacity at Top of Dam

The capacity of the principal spillway with the reservoir at top of dam elevation (1789.2 ft MSL) is 431 cfs. The capacity of the emergency spillway is 21,706 cfs at this level.

4) Ungated Spillway Capacity at Test Flood

The capacity of the principal spillway with the reservoir at test flood elevation (1786.9 ft. MSL) is 401 cfs. The capacity of the emergency spillway is 12,114 cfs at this level.

5) Gated Spillway Capacity at Normal Pool

There are no gated spillways.

6) Gated Spillway Capacity at Test Flood

As previously mentioned, there are no gated spillways.

7) Total Spillway Capacity at Test Flood

The total spillway capacity at test flood elevation (1786.9 ft. MSL) is 12,515 cfs.

c. Elevation (ft. above NGVD)

1) Streambed at toe of dam: 1735.3

2) Bottom of cutoff: variable, approximately 1735 minimum

3) Maximum tailwater - unknown, outlet conduit invert 1736.0

4) Normal pool: 1752.0

5) Full flood control pool: 1782.0

6) Spillway crest - Low level orifice: 1752.0

High level orifice: 1772.0

Emergency spillways: 1782.0

7) Design surcharge (original Design): 1787.2

8) Top of Dam: 1789.2

9) Test flood surcharge: 1786.9

d. Reservoir (Length in feet)

1) Length of maximum pool: $4,000^+$ ft.

2) Length of normal pool: 1700^+ ft.

3) Length of flood control pool: 3700^+ ft.

e. Storage (acre-feet)

1) Normal pool: 45.0

2) Flood control pool: 1029.0

3) Spillway crest pool:

a) Low stage inlet: 45.0

b) High stage inlet: 471.0

c) Emergency spillway: 1029.0

4) Top of dam: 1643

5) Test flood pool: 1389

f. Reservoir Surface (acres)

- 1) Normal pool: 8.5
- 2) Flood control pool: 74.0
- 3) Spillway crest pool
 - a) Low stage inlet: 8.5
 - b) High stage inlet: 42.0
 - c) Emergency spillway: 74.0
- 4) Test flood: 91.5
- 5) Top of dam: 98.5

g. Dam

- 1) Type: Earth Embankment
- 2) Length: 1300 ft.
- 3) Height: 54 ft.
- 4) Top Width: 18 ft.
- 5) Side Slopes:
Upstream: 3H:1V
Downstream: 2.5H:1V
- 6) Zoning: Homogeneous semi-pervious silty sand and gravel, blanket type seepage drain under 70% of downstream embankment.
- 7) Impervious Core: None
- 8) Cutoff: 14 ft. width, earthfill
- 9) Grout Curtain: None

h. Diversion and Regulating Tunnel

Not applicable

i. Spillways

- 1) Type:
 - a) Principal Spillway: Reinforced concrete drop inlet
 - b) Emergency Spillway: Grass covered earth channel cut in south abutment
- 2) Length of Weir:
 - a) Low Level Orifice: 24 in.
 - b) High Level Orifice: 24 ft.
 - c) Emergency Spillway: 350 ft.
- 3) Crest Elevation: (feet above NGVD)
 - a) Low Level Orifice: 1752.0
 - b) High Level Orifice: 1772.0
 - c) Emergency Spillway: 1782.0

- 4) Gates: None
 - 5) Upstream Channel: Tributary of Gates Creek, narrow stream to reservoir through farm and woodland
 - 6) Downstream Channel: Tributary of Gates Creek, narrow stream through farm and woodland
- j. Regulating Outlet:

There is a reservoir drain consisting of 8 ft-24 in. diameter drop inlet with the top 6 ft. perforated. The inlet drains through a 12 in. diameter pipe equipped with a 12 in. lift gate and rising stem at the riser structure. The invert of the inlet is 1740.0 (NGVD)

SECTION 2 - ENGINEERING DATA

2.1 GEOLOGY

Bedrock at the dam site is upper Devonian Age (345-375 million years ago) interbedded shales, siltstones, and sandstones. These relatively underformed sedimentary rocks are medium hard. Regionally, the rock forms a homoclinal which dips southward to southwestward at approximately 40 feet per mile. Small terraces and low folds modify this dip to essentially flat-lying over short distances. Only minor folding and faulting are found in the region with no major or active faults known to exist in the area.

The Ischua Creek Watershed Dam No. 5 is located in a region classified as Zone 2 seismicity, as shown on Figure No. 1 of the Recommended Guidelines for Safety Inspections of Dams.

Pleistocene glaciation (beginning approximately 2 million years ago) has modified the topography by means of erosion and deposition. The thick continental ice sheet advanced and receded many times in south western New York smoothing terrain by glacial scour and mantling the uplands with till deposits.

The pleistocene geology of the dam site consists of glacial ground moraine deposits. Dense clayey glacial tills with moderate amounts of siltstone and sandstone channers comprising the coarse fraction of the till, and overlying alluvial glacial deposits comprise the overburden of the dam site. In recent times, alluvium from upland erosion, has been deposited on the glacial material.

2.2 SUBSURFACE INVESTIGATION

Test hole logs are contained in the "As-Built" drawings. A number of test pits and drill holes were dug to determine subsurface conditions.

2.3 DESIGN RECORDS

The records available for the project consists of 10 contract drawings which show the plans, sections and details of the dam, appurtenant structures, impact basin details and grating, fencing details, and logs of test holes; and a design report issued by the U.S. Soil Conservation Service dated April 4, 1961.

2.4 CONSTRUCTION RECORDS

Construction records and specifications are available at the U.S. Soil Conservation Service, Design Section, Syracuse, New York.

2.5 OPERATION RECORDS

No written maintenance or operation records exist for the dam.

2.6 EVALUATION OF DATA

Information obtained from the "As-Built" drawings is consistent with observations made during this inspection. The information obtained from available data was considered adequate for the Phase I inspection and evaluation.

SECTION 3 - VISUAL INSPECTION

3.1 Findings

a. General

The Ischua Creek Watershed Dam No. 5 is in good condition at the present time.

b. Dam

1) Earth Embankment (See Photos 2, 4 and 5)

The brush growth is light on this embankment and no animal burrows were noted during the inspection of this dam. The entire dam shows a relatively high moisture content. However, this is believed to be the result of the recent spring thaw. The high moisture condition is not considered a problem with the exception of two areas noted below.

A berm approximately 10 ft. wide located on the downstream slope has been constructed in such a way that it collects surface runoff. As a result there is ponded water all along the top of this berm. Provision should be made to provide a drainage path for this ponded water.

Erosion gullies up to 6 inches deep were noted in the left upstream abutment contact. These are the result of high concentrations of surface runoff from the adjacent emergency spillway section. Some form of drainage path should be provided to prevent erosion in this area.

The crest of the dam is in good condition with no evidence of vertical or horizontal movement.

There is no slope protection on the upstream slope other than the vegetative cover and a 10 ft. berm at the waterline. Approximately 1 to 2 inches of erosion due to wave action was noted at the water line on the upstream slope.

The blanket type toe drain under the downstream slope appears to be functioning properly as no seepage was noted at the dam. The cobble drain is moist over its entire length, but it is not clear whether this water is emanating from the drain or surface runoff.

A small area to the left of the intake structure on the upstream slope has been subjected to sloughing on the order of 2 to 3 ft. in diameter.

2) Emergency Spillway (See Photos 3 and 6)

The emergency spillway is generally in good condition with the exception of a large area of ponded runoff or natural groundwater. This area appears to be entirely upstream of the control section of the channel and encompasses the entire upstream end of the emergency spillway. Drainage of this impounded water has caused erosion gullies along the upstream end of the channel leading into the reservoir as well as the gullies discussed in the previous section.

c. Principal Spillway

The water surface was at the top of the orifice opening in the riser (elevation 1753.5 ft. MSL) and protected with an effective trash rack. The riser was in excellent condition with no evidence of spalling, cracking, or efflorescence. The gate which could be used to drain the reservoir was covered with water at the time of observation so the mechanism was not visible.

d. Reservoir Area (See Photo 1)

The shore of the reservoir is generally shallow sloping pasture or woodland. It appears to be stable and in good condition.

e. Downstream Channel

The downstream channel is a narrow channel passing over relatively a flat flood plain. There is rip rap protection of the plunge pool, but erosion of the banks has taken place above the level of the rip rap 300 ft. downstream of the outlet.

3.2 Evaluation

The dam is generally in good condition. The potential problems noted during the visual inspection are listed below:

- a. Drainage gullies on the main dam and upstream of the emergency spillway;
- b. Ponded water in the emergency spillway channel and the berm on the downstream slope;
- c. Erosion of the downstream channel banks above the level of the rip rap;
- d. Sloughing of the upstream slope to the left of the intake structure;
- e. Operation of the drain gate could not be checked due to its location below the water surface,
- f. The inaccessibility of the drain gate.

SECTION 4 - OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

No written operation and maintenance procedures exist for the project. The normal operation of the project consists of allowing water to flow through the service spillway outlet pipe.

4.2 MAINTENANCE OF DAM

Maintenance of the dam is performed when the need arises. Maintenance is not considered adequate.

4.3 WARNING SYSTEM IN EFFECT

No warning system is in effect or in preparation.

4.4 EVALUATION

The overall condition of the dam and appurtenant structures appears to be good. Recommendations in connection with regular maintenance are discussed in Section 7.

SECTION 5 - HYDRAULIC/HYDROLOGIC

5.1 Drainage Area Characteristics

The Ischua Creek Dam No. 5 is located on a tributary of Gates Creek, a tributary of Ischua Creek, in the Allegheny River basin, and has a drainage area of 6.4 square miles. The dam is situated approximately 3.5 miles southeast of Franklinville, New York with its confluence with Ischua Creek about 1 miles south of Franklinville. Dam NY00571 is located on Gates Creek approximately 2.8 miles downstream of the dam. The topography of the watershed varies between steep and gentle sloping hills.

5.2 Design Data

This dam was designed as a class (c) structure in accordance with criteria as established in Washington Engineering Memorandum SCS-27. Under this classification the emergency spillway is designed for a rainfall equal to $P(100) + 0.26[PMP-P(100)]$, while the freeboard pool is designed for the PMP rainfall.

The Soil Conservation Service (SCS) design calculations have been reviewed. The dam was designed to pass the 100-year flood with antecedent moisture condition III, without discharging through the emergency spillway. The peak inflow is 3577 cfs, peak outflow is 305 cfs and peak elevation is 1782.0 ft. (MSL). The SCS design allowed for a 50-year sediment accumulation with a surface area of 8.5 acres, elevation of 1752.0 ft. (MSL) and a storage of 45.0 acre-ft. The principal spillway consists of a 48" diameter reinforced concrete water pipe and a 4' x 12' reinforced concrete riser. The riser has a low orifice elevation of 1752.0 ft. (MSL) and a crest elevation of 1772.0 ft. (MSL). The emergency spillway control cross section is 350 ft. wide with side slopes of 3 horizontal to 1 vertical and a crest elevation of 1782.0 ft. (MSL). The dam crest elevation is 1789.2 ft. (MSL).

5.3 Analysis Criteria

The analysis of the spillway capacity of the dam and the storage of the reservoir was performed using the Corps of Engineers HEC-1 Dam Safety Version computer model. The unit hydrograph was defined by the Snyder Synthetic Unit Hydrograph method, and the Modified Puls routing procedure was incorporated. The Probable Maximum Precipitation (PMP) was 22.5 in. (24 hrs., 200 sq. miles) from Hydrometeorological Report #33 in accordance with recommended guidelines of the Corps of Engineers. The dam is 54 ft. high and impounds approximately 1643 acre-ft. at the top of the dam. The dam is classified as a HIGH hazard and INTERMEDIATE in size, according to the Recommended Guidelines of the Corps of Engineers. The spillway design flood is the PMF. The floods selected for analysis were 20, 40, 50, 60, 80 and 100% of the Probable Maximum Flood (PMF) flows. The PMF inflow of 12,597 cfs was routed through the reservoir and the peak outflow was determined to be 12,515 cfs. The peak PMF outflow would produce an eroding velocity of 11.2 ft./sec. on the emergency spillway.

5.4 Reservoir Capacity

The reservoir capacities at the crest of the emergency spillway, and at the top of the dam are 1029 acre-ft. and 1643 acre-ft., respectively. Surcharge storage between the emergency spillway crest and the top of the dam is equivalent to 1.80 in. of runoff from the drainage area.

5.5 Experience Data

There are no flood records for the dam site. However, during the field investigation, evidence of recent high water was observed at elevation 1769.7 ft. (MSL). This reservoir elevation corresponds to a peak outflow of 57 cfs.

5.6 Overtopping Potential

The maximum capacity of the spillways is 22,137 cfs which is greater than the PMF peak outflow of 12,515 cfs. The dam is not overtopped by the PMF, the peak elevation being 2.3 ft. below the top of dam.

5.7 Analysis of Downstream Impacts

During the field investigation, dwellings and highways located downstream of the dam were identified and referenced to the channel invert. The cross section locations used in the downstream channel routing are shown on Page D-2, Appendix D. The impacts of the PMF on dwellings located downstream of the dam are shown in Table 5.1. For the purposes of this analysis, a danger of loss of life was assumed to exist if the computed PMF water surface was above the first floor elevation of a structure. The drainage area of Gates Creek upstream of the confluence of tributary leading downstream from the dam was modeled into the analysis. The impacts shown in Table 5.1 are a result of the discharges from both Gates Creek and the dam. This situation occurs with two structures at location 1 and 1 structure at location 2. The road crossing at location 1 would be overtapped with the PMF.

5.8 Evaluation

The spillway of the Ischua Creek Watershed Dam No. 5 will safely pass the PMF without overtapping. The spillway is, therefore, assessed as "Adequate". Potential problems include:

- a. Erosion of the emergency spillway for the test flood condition. Because of the low probability of occurrence of the PMF, and because there is no cost effective means of preventing the erosion, no preventative recommendations are deemed necessary.
- b. The danger of loss of life and economic damage downstream of the dam for the test flood conditions

TABLE 5.1
SUMMARY OF DOWNSTREAM IMPACTS FOR PMF

Location # (see page D-2 Appendix D)	Location	# of Dwellings	Structure Height above Streambed* (ft)	Peak Flow (cfs)	Peak Stage (ft)	Comments
1	2100' d/s of dam & just d/s of confluence w/Gates Creek	2 1	9 17	23,893 23,893	12' 12'	Danger of loss of life Road overtopped -
2	200' d/s of of Location #1	1 2	7 ⁺³⁰	23,897 23,902	12' -	Danger of loss of life Road overtopped -
3	3300' d/s of #2	2	⁺³⁰	23,895	10'	-

*The structure height above the streambed is the difference between the first floor elevation and the channel invert.

SECTION 6 - STRUCTURAL STABILITY

6.1 Visual Observations

There does not appear to be significant displacement or distress associated with the embankments at this site. The dam appears to be in good condition at the present time.

6.2 Design and Construction Data

Analyses carried out during the design and construction phase included a slope stability analysis by the Swedish circle method. The parameters assumed were:

Upstream slope: 3H:1V, full drawdown, 8 ft. berm at 1771 ft,
 $\phi = 33^\circ$, $c = 650 \text{ psf}$.

Downstream slope: 2.5H:1V, blanket drain, no berm,
 $\phi = 33^\circ$, $c = 650 \text{ psf}$.

The factors of safety calculated were 1.64 for the upstream slope and 1.57 for the downstream slope. They are considered adequate according to the recommended Phase I guidelines.

6.3 Post Construction Changes

There have been no known changes to any of the embankments or structures at this dam.

6.4 Seismic Stability

The dam is located in seismic zone No. 3 and, in accordance with the recommended Phase I guidelines, a seismic stability analysis is warranted. This should be accomplished by a qualified registered professional engineer and should be made part of the record for this dam.

SECTION 7 - ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

Examination of the available documents and visual inspections of Ischua Creek Watershed Dam No. 5 and appurtenant structures did not reveal any conditions which constitute a hazard to human life or property. The dam and its appurtenances are considered to be in good condition at the present time.

Using the Corps of Engineers screening criteria for review of spillway adequacy, it has been determined that the dam would not be overtopped for the spillway design flood of the full PMF. The principal and auxiliary spillway capacity are, therefore, judged as adequate.

b. Adequacy of Information

This report and its conclusions are based on visual inspection, interview data, contract drawings, and office hydrologic/hydraulic studies. This information and data are adequate for a Phase I inspection.

c. Need for Additional Investigations

It is recommended that the services of a qualified registered professional engineer be retained to evaluate:

- a. the source of the ponded water on the emergency spillway and the berm on the downstream face of the dam.
- b. the sloughing on the upstream slope to the left of the intake structure.

d. Urgency

The recommended investigation should be completed within 12 months of notification to owner and remedial actions resulting from these investigations completed in the subsequent 12 months. The remedial measures or actions listed below should be completed within one year from notification to owner.

7.2 RECOMMENDED MEASURES

- a. The results of the aforementioned investigations will determine the remedial measures concerning the ponded water on the emergency spillway and the berm on the downstream face of the dam, as well as the sloughing on the upstream slope.

- b. Install ladder rungs on the riser to provide access to the drain gate housing.
- c. Regrade and fill in the erosion gullies on the upstream slope.
- d. Remove vegetation on the slopes and crest of the embankment and the immediate downstream channel. Provide a program of periodic cutting and mowing of these surfaces.
- e. Clear debris from the trash racks and upstream slopes periodically.
- f. Implement a program of periodic inspection and maintenance of the dam and appurtenances including yearly operation and lubrication of the gate system. Document this information for future reference.
- g. Develop a formal written downstream warning system to alert the appropriate officials and residents in the event of an emergency.

APPENDIX A

VISUAL INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam Ischua Creek Watershed Dam No. 5
Fed. I.D. # NY 00565 DEC Dam No. 25-2980
River Basin Allegheny
Location: Town Franklinville County Cattaraugus
Stream Name Gates Creek
Tributary of Ischua Creek
Latitude (N) 42° 18.8' Longitude (W) 78° 24.1'
Type of Dam Earth Embankment
Hazard Category High
Date(s) of Inspection April 2, 1981
Weather Conditions Sunny, Windy, 50°
Reservoir Level at Time of Inspection Approximately elevation 1753.5 ft.

b. Inspection Personnel Mr. Robert Farrell, Mr. Ken Avery, Mr. James Reynolds,
Mr. Jeff Hardin

c. Persons Contacted (including Address & Phone No.)
U.S. Soil Conservation Service, Rm 771-Federal Bldg., So. Clinton St., Syracuse, N.Y.
State Construction Engineer: Philip "Skip" Nelson 1-315-423-5502
Area 1 Project Engineer (Batavia): Pete Wright 1-716-343-3664
Contracting Ofc. for Ischua Creek Watershed: Ed Smith - contacted through Pete Wright

d. History:

Date Constructed 1961 Date(s) Reconstructed _____
Designer U.S.D.A. Soil Conservation Service
Constructed by _____
Owner Ischua Creek County Small Watershed Protection District

2) Embankment

a. Characteristics

- (1) Embankment Material Silty sand and gravel. Homogeneous
- (2) Cutoff Type Trench cut into natural ground, variable depth, generally 12 feet wide at bottom. Cut into silty sand and gravel
- (3) Impervious Core None
- (4) Internal Drainage System Blanket drain two feet thick from 40 downstream of centerline to the downstream toe. Drains to a cobble drain along the downstream toe.
- (5) Miscellaneous Side slopes 2.5H:1V downstream and 3H:1V upstream

b. Crest

- (1) Vertical Alignment Good
- (2) Horizontal Alignment Good
- (3) Surface Cracks Not noted
- (4) Miscellaneous

c. Upstream Slope

- (1) Slope (Estimate) (V:H) 1 vertical to 3 horizontal
- (2) Undesirable Growth or Debris, Animal Burrows Brush and grass growth light. No animal burrows noted
- (3) Sloughing, Subsidence or Depressions 3 sloughs approximately 3 feet in diameter located approximately 30 feet left of the intake structure, approximately 5 to 10 feet above the low level inlet

(4) Slope Protection Grass, no riprap on upstream slope, 10 feet berm at waterline. Approximately 2 inches of wave erosion at waterline

(5) Surface Cracks or Movement at Toe None noted

d. Downstream Slope

(1) Slope (Estimate - V:H) 1 vertical to 2.5 horizontal

(2) Undesirable Growth or Debris, Animal Burrows None noted

(3) Sloughing, Subsidence, or Depressions None noted

(4) Surface Cracks or Movement at Toe None noted

(5) Seepage None noted. Entire slope was moist but no flow was observed

(6) External Drainage System (Ditches, Trenches, Blanket) A cobble drain extends along the downstream slope to the left of the outlet conduit. The drain was moist but no flow was observed. Drainage should be provided for the 10 foot berm crest

(7) Condition Around Outlet Structure Generally good

(8) Seepage Beyond Toe None noted

e. Abutments - Embankment Contact

Some erosion due to natural ground or surface water flow

(1) Erosion at Contact Erosion gullies up to 6" deep at left upstream abutment contact resulting from surface runoff. Drainage path should be provided

(2) Seepage Along Contact None noted

3) Drainage System

(a) Description of System 2 ft. thick blanket drain from 40 ft. downstream of centerline to downstream toe. Drains to a cobble drain along the toe which drains to the outlet channel.

(b) Condition of System Appears to be functional. Cobble drain slightly overgrown.

(c) Discharge from Drainage System None noted

4) Instrumentation (Monumentation/Surveys, Observation Wells, Weirs, Picometers, etc.) None installed

5) Reservoir

a. Slopes Appear stable and in good condition

b. Sedimentation Very minor accumulation

c. Unusual Conditions Which Affect Dam Heavy moisture in emergency spillway channel

6) Area Downstream of Dam

a. Downstream Hazard (No. of homes, highways, etc) Refer to Table 5.1 for a summary of downstream dwellings and highways

b. Seepage, unusual growth None noted

c. Evidence of movement beyond toe of Dam None noted

d. Conditions of Downstream Channel Generally good. Some erosion above rip rap, should be repaired.

7) Spillway(s) (including Discharge Conveyance Channel)

Principal spillway: Drop inlet structure with outlet conduit to impact basin. Vegetated

earth emergency spillways: 350 ft. wide at right abutment.

a. General Good

b. Condition of Service Spillway Excellent

c. Condition of Emergency Spillway Generally good, spillway (left) shows heavy concentration of ponded water. This is probably the result of natural groundwater and spring thaw

d. Condition of Discharge Conveyance Channel Channel banks eroded above rip rap

8) Reservoir Drain/Outlet

Type: Pipe Conduit _____ Other _____

Material: Concrete _____ Metal Other _____

Size: 12" Length 48'

Invert Elevations: Entrance _____ Exit _____

Physical Condition (Describe): Unobservable

Material: _____

Joints: _____ Alignment _____

Structural Integrity: _____

Hydraulic Capability: _____

Means of Control: Gate _____ Valve Uncontrolled _____

Operation: Operable _____ Inoperable Other _____

Present Condition (Describe): No handle

9) Structural

- a. Concrete Surfaces _____ N/A

- b. Structural Cracking _____ N/A

- c. Movement - Horizontal & Vertical Alignment (Settlement) _____ N/A

- d. Junctions with Abutments or Embankments _____ N/A

- e. Drains - Foundation, Joint, Face _____ N/A

- f. Water Passages, Conduits, Sluices _____ N/A

- g. Seepage or Leakage _____ N/A

- h. Joints - Construction, etc. _____ N/A

- i. Foundation _____ N/A

- j. Abutments _____ N/A

- k. Control Gates _____ N/A

- l. Approach & Outlet Channels _____ N/A

m. Energy Dissipators (Plunge Pool,etc) _____ N/A

n. Intake Structures _____ N/A

o. Stability _____ N/A

p. Miscellaneous _____ N/A

10) Appurtenant Structures (Power House, Lock, Gatchouse, Other)

a. Description and Condition _____ None

APPENDIX B

ENGINEERING DATA

APPENDIX B

<u>TITLE</u>	<u>PAGE</u>
Cover Sheet	B-2
Plan of Storage Areas	B-3
Damsite	B-4
Profiles	B-5
Seepage Drain Details	B-6
Plan-Profile of Principal Spillway	B-7
Riser Details	B-8
Cradle, Collar & Bent Details	B-9
Gate Well, Trash Racks & Misc. Details	B-10
Fence Details	B-11

ISCHUA

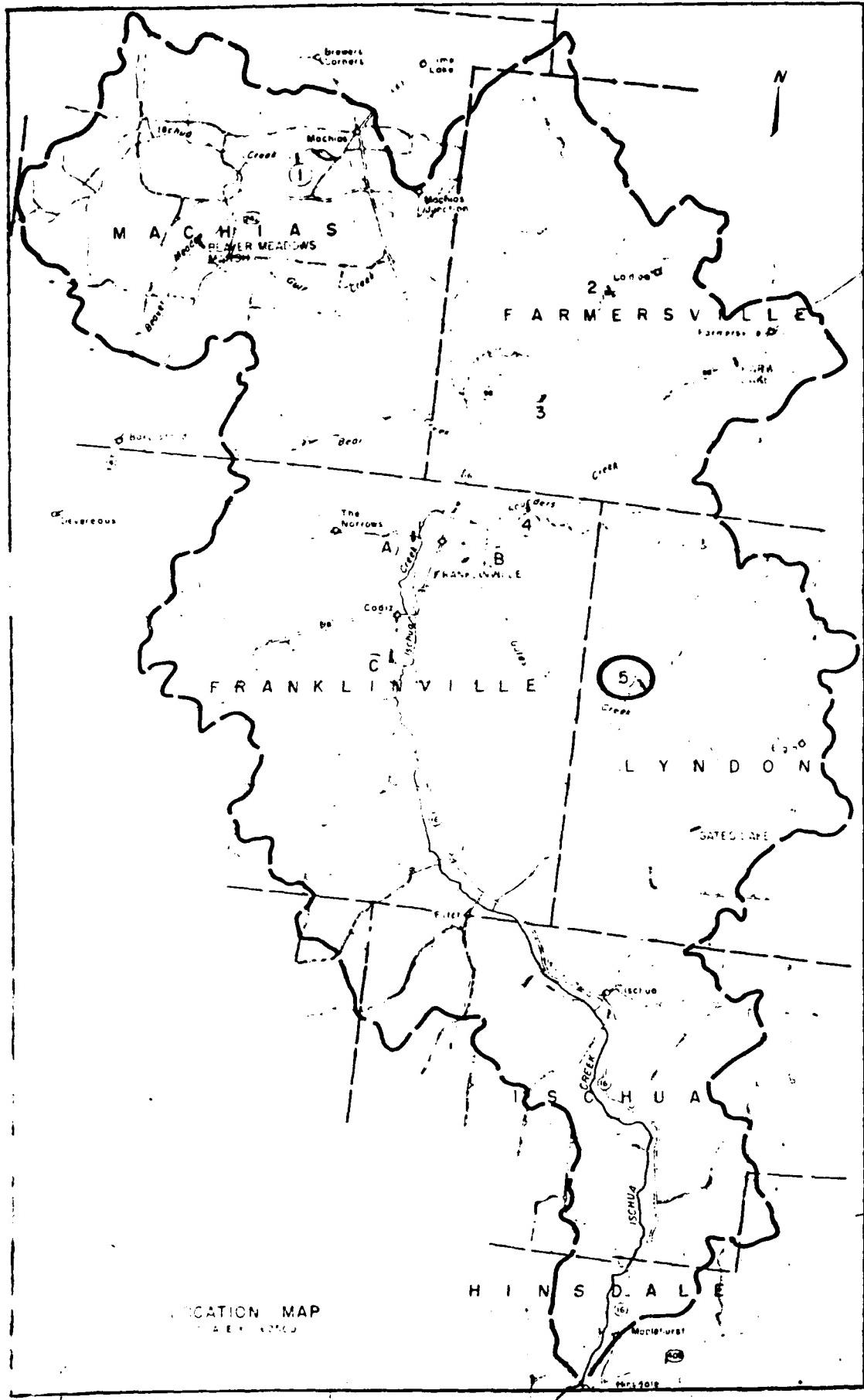
FL

DRAINAGE
TOTAL
WATER
HEIGHT
VOLUME

BUILT

IS

- SHEET 1 COVER S
- SHEET 2 PLAN OF
- SHEET 3 DAMSITE
- SHEET 4 PROFILE
- SHEET 5 SEEPAGE
- SHEET 6 PLAN-PR
- SHEET 7 RISER D
- SHEET 8 CRADLE
- SHEET 9 GATE W
- SHEET 10 FENCE



LOCATION MAP
1:250,000

ISCHUA CREEK WATERSHED PROJECT

FLOODWATER RETARDING DAM NO. 5

565

DRAINAGE AREA	4096	Acres
TOTAL STORAGE	1085	Acre ft.
WATER SURFACE AREA	8.5	Acres
HEIGHT OF DAM	52	Feet
VOLUME OF FILL	214000	Cubic Yards

BUILT UNDER THE WATERSHED PROTECTION AND
FLOOD PREVENTION ACT

by

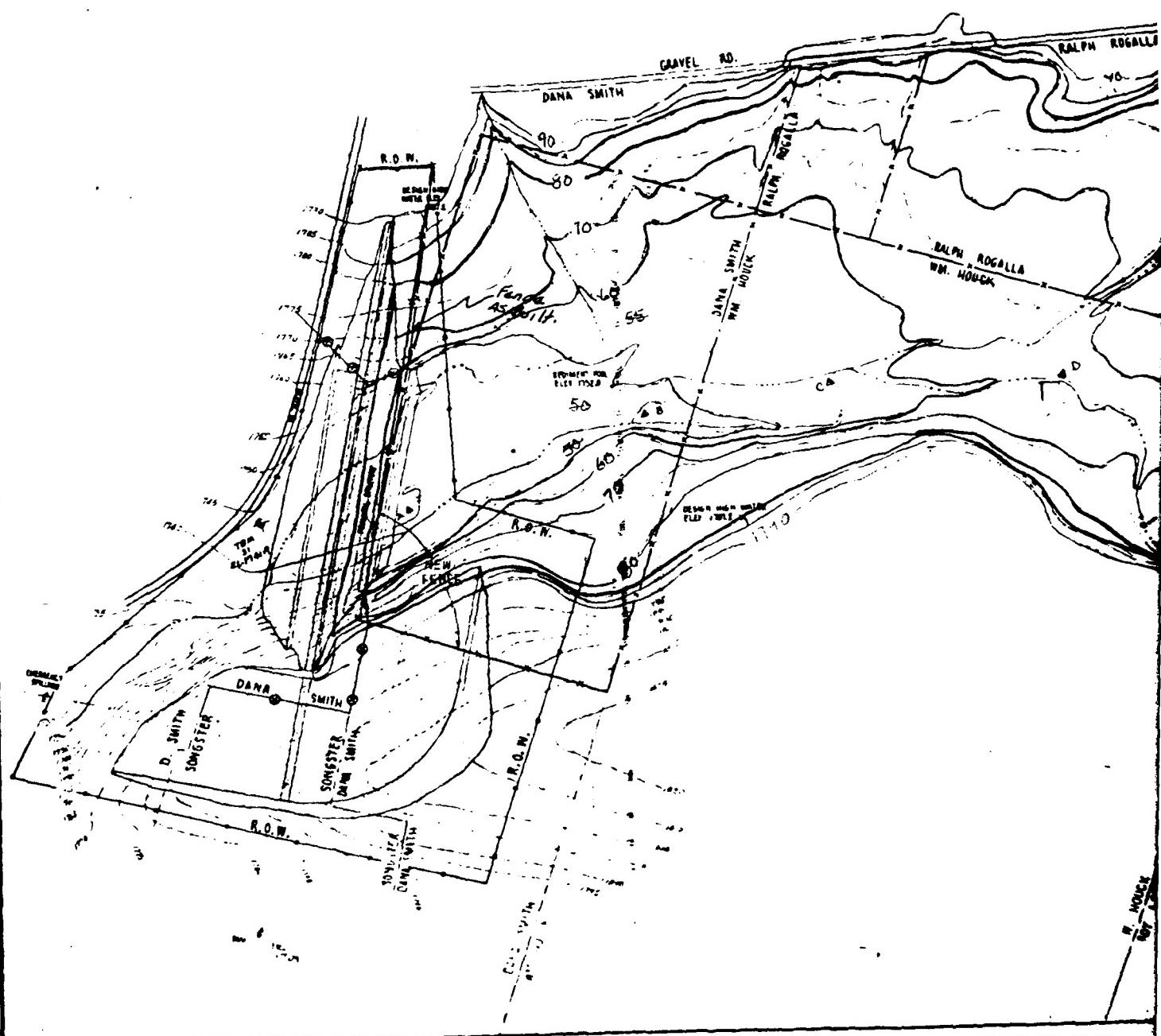
ISCHUA CREEK SMALL WATERSHED DISTRICT
with the assistance of
SOIL CONSERVATION SERVICE
of the
U.S. DEPARTMENT OF AGRICULTURE

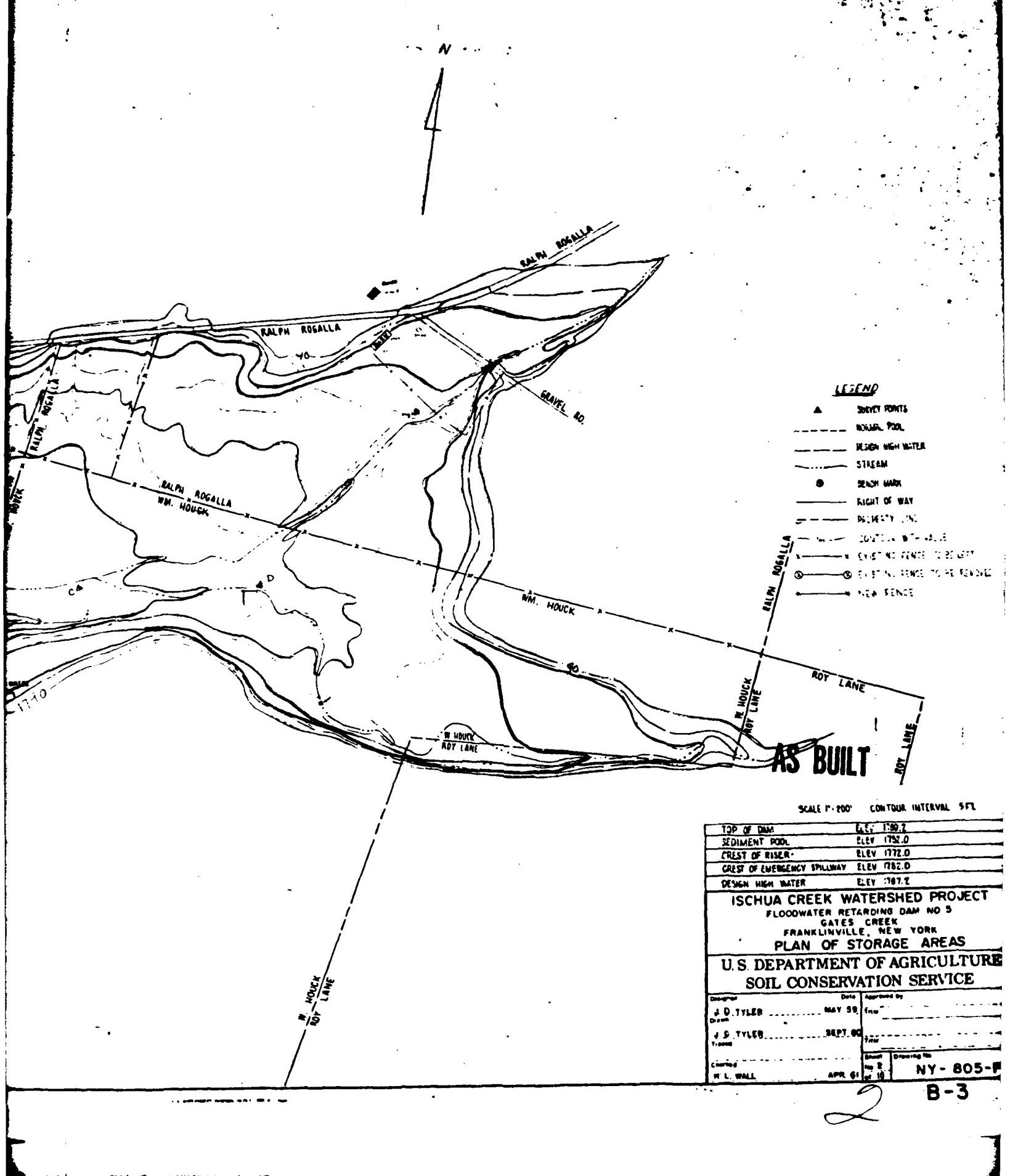
SHEET 1 COVER SHEET
SHEET 2 PLAN OF STORAGE AREAS
SHEET 3 DAMSITE
SHEET 4 PROFILES
SHEET 5 SEEPAGE DRAIN DETAILS
SHEET 6 PLAN-PROFILE OF PRINCIPAL SPILLWAY
SHEET 7 RISER DETAILS
SHEET 8 CRADLE, COLLAR & BENT DETAILS
SHEET 9 GATE WELL, TRASH RACKS & MISC. DETAILS
SHEET 10 FENCE DETAILS

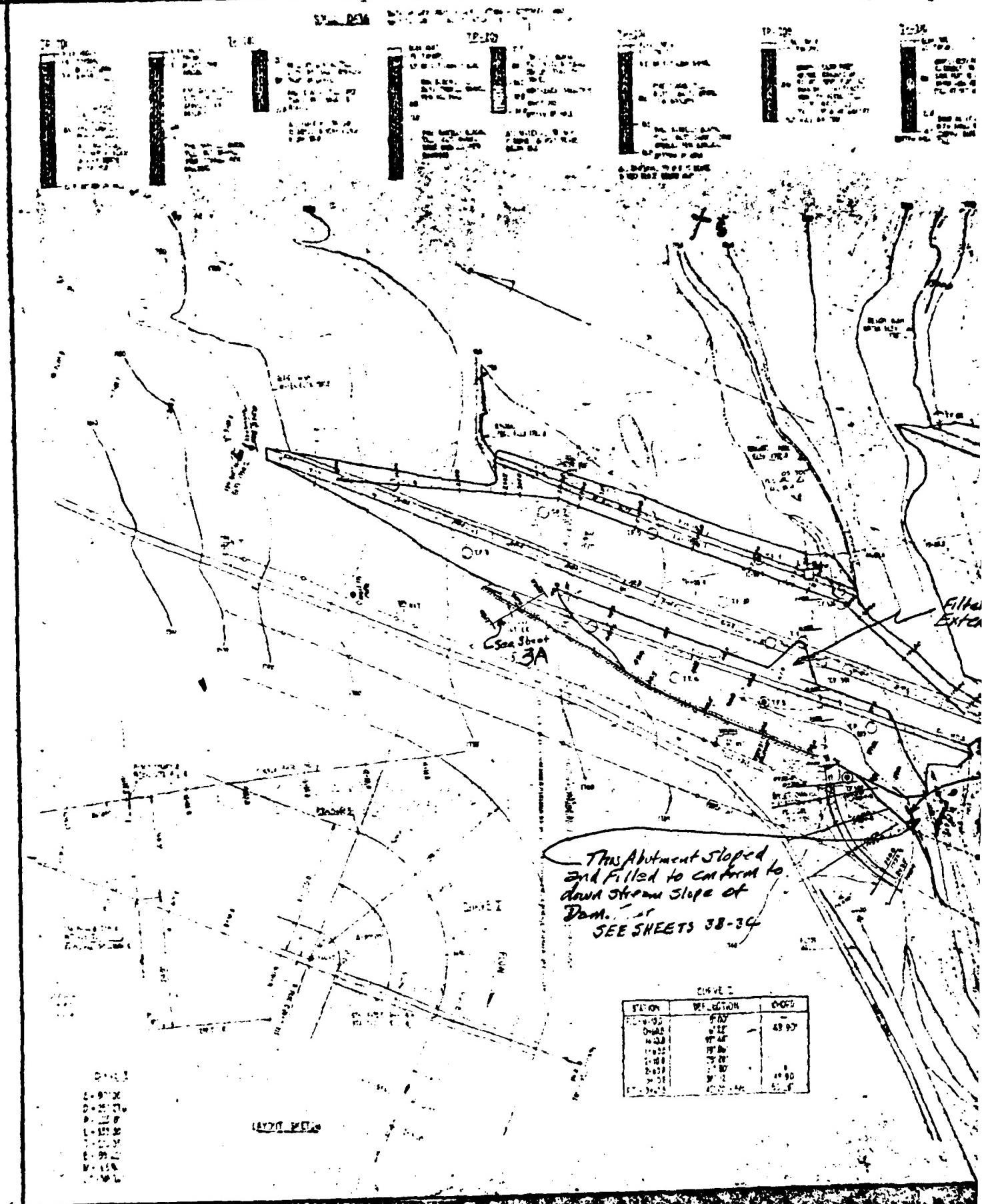
AS BUILT

ISCHUA CREEK WATERSHED PROJECT	
FLOODWATER RETARDING DAM NO. 5	
GATES CREEK	
FRANKLINVILLE, NEW YORK	
COVER SHEET	
U.S. DEPARTMENT OF AGRICULTURE	
SOIL CONSERVATION SERVICE	
H. L. WALL	APR '61
M. NIKOLICH	HEAD OF ENGINEERING
STATE CONSERVATION ENGR	
NY - 805 - P	

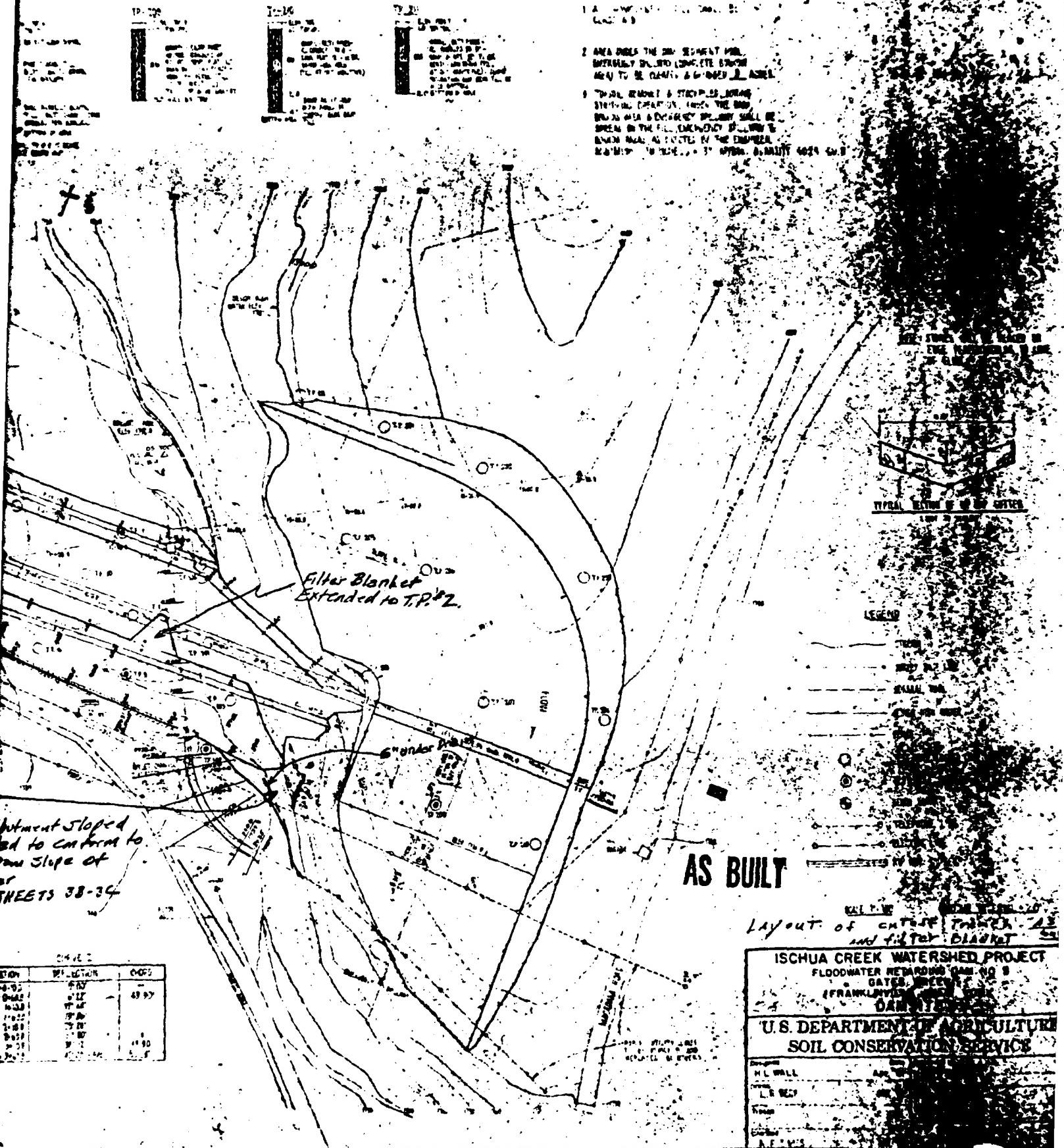
2 B-2

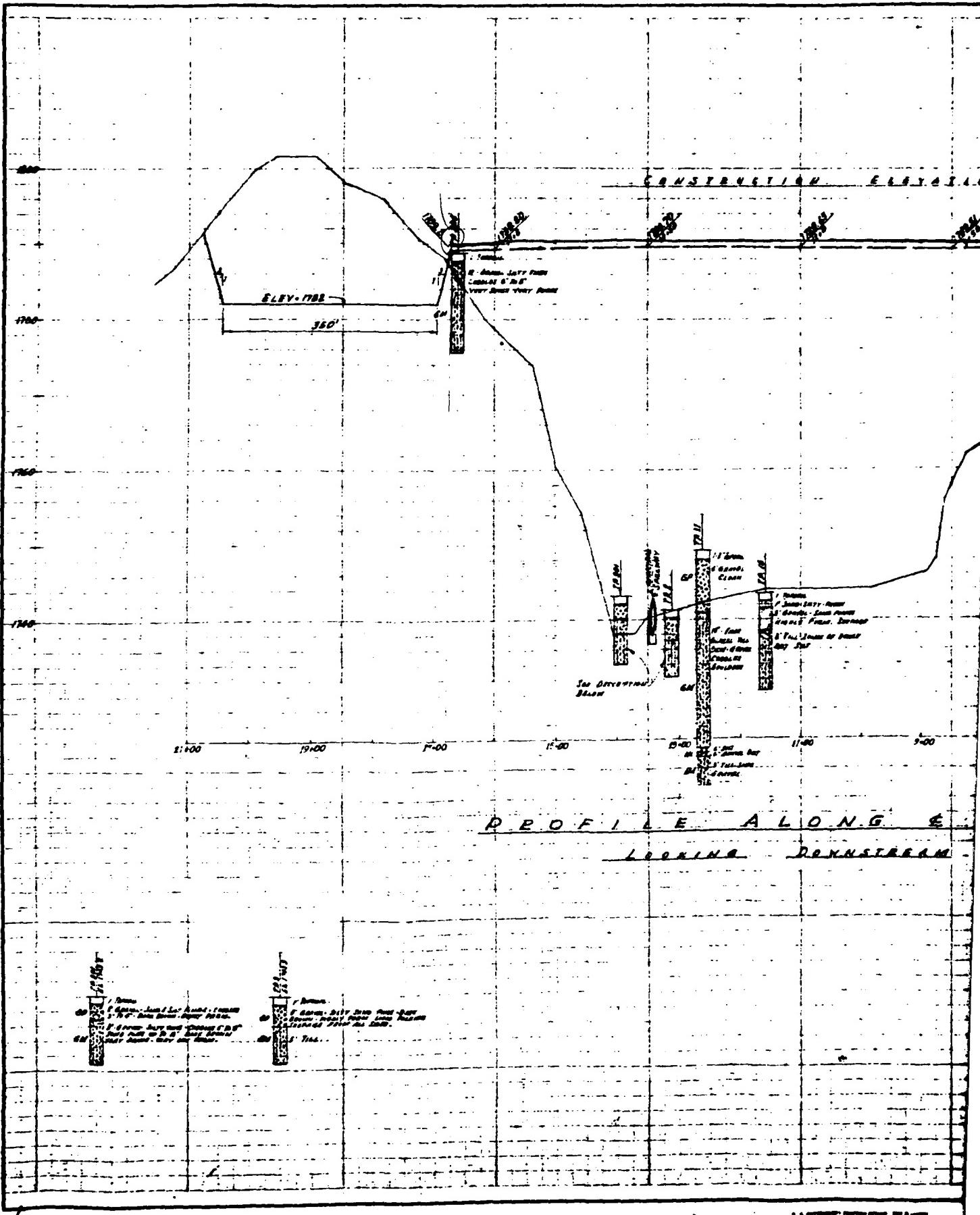




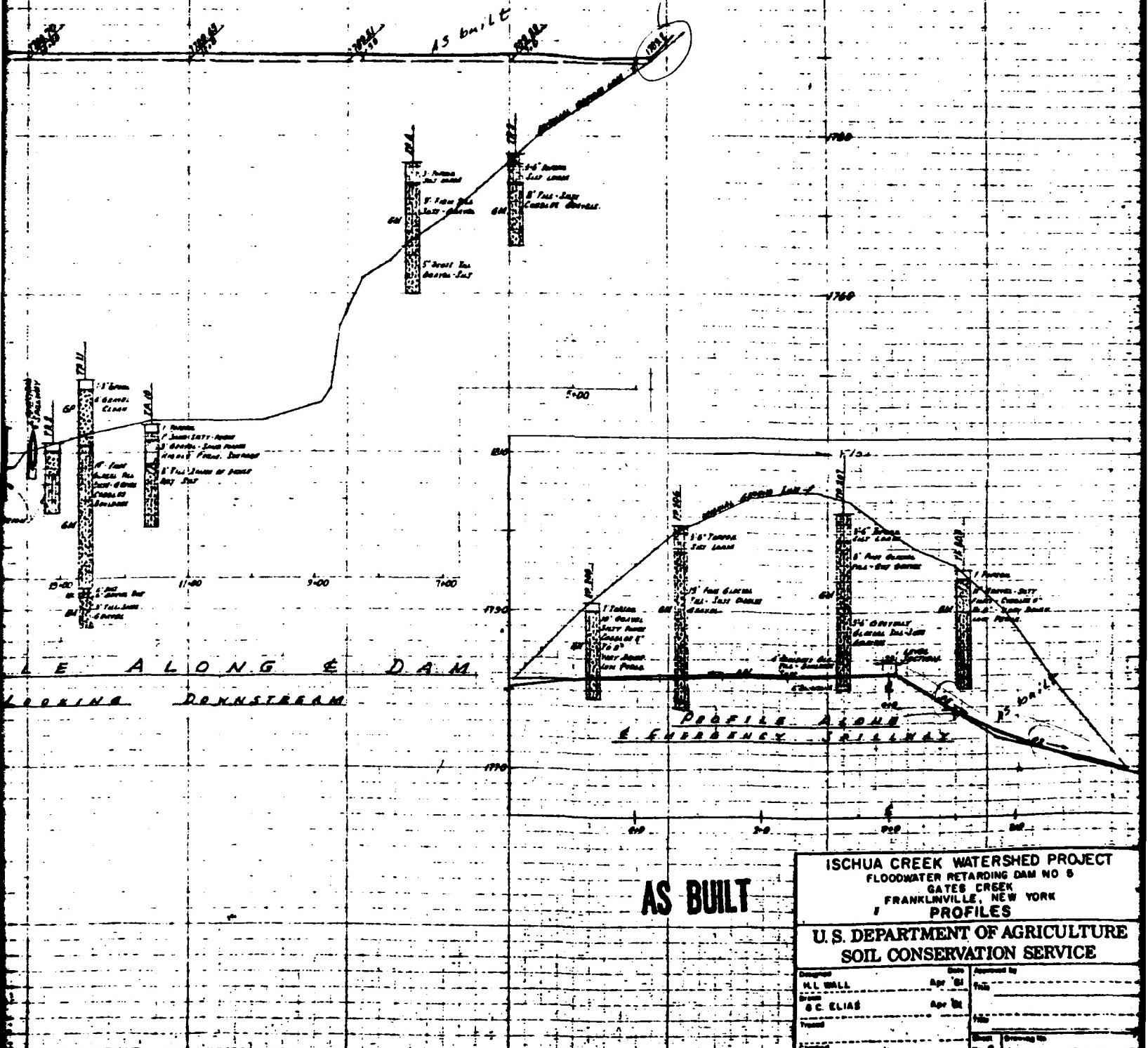


SECTION	ELEVATION	DOFS
FC-1-03	FAD	43.93
FC-1-04	43.92	
FC-1-05	43.91	
FC-1-06	43.90	
FC-1-07	43.89	

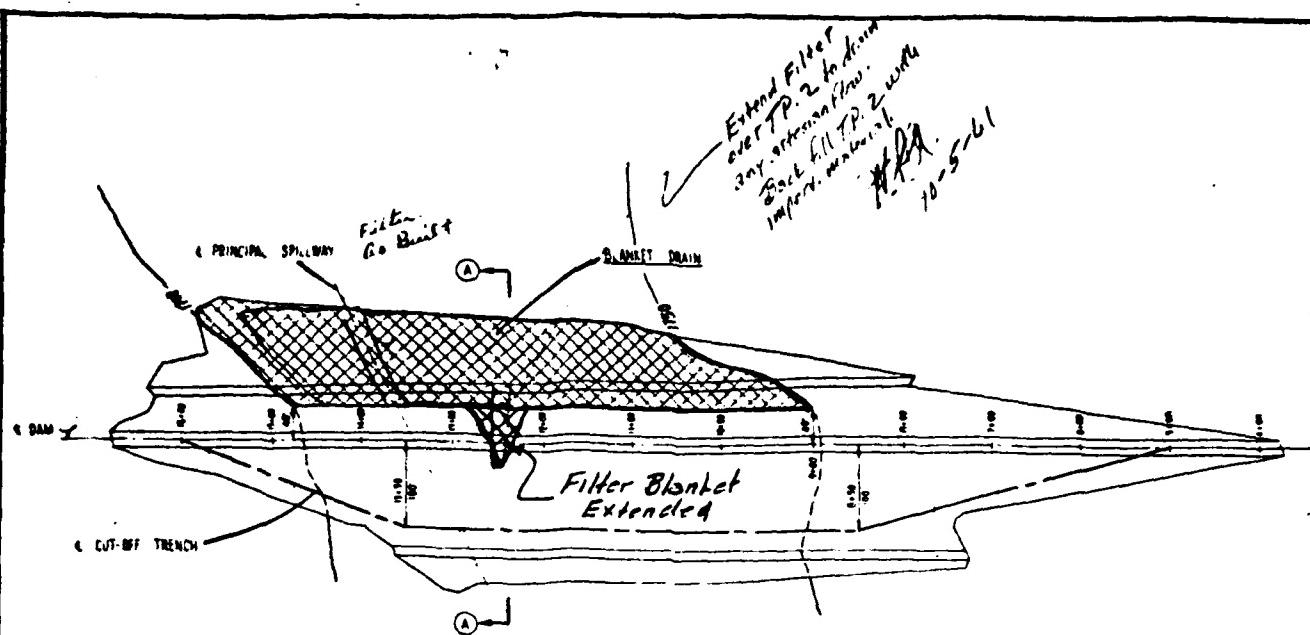




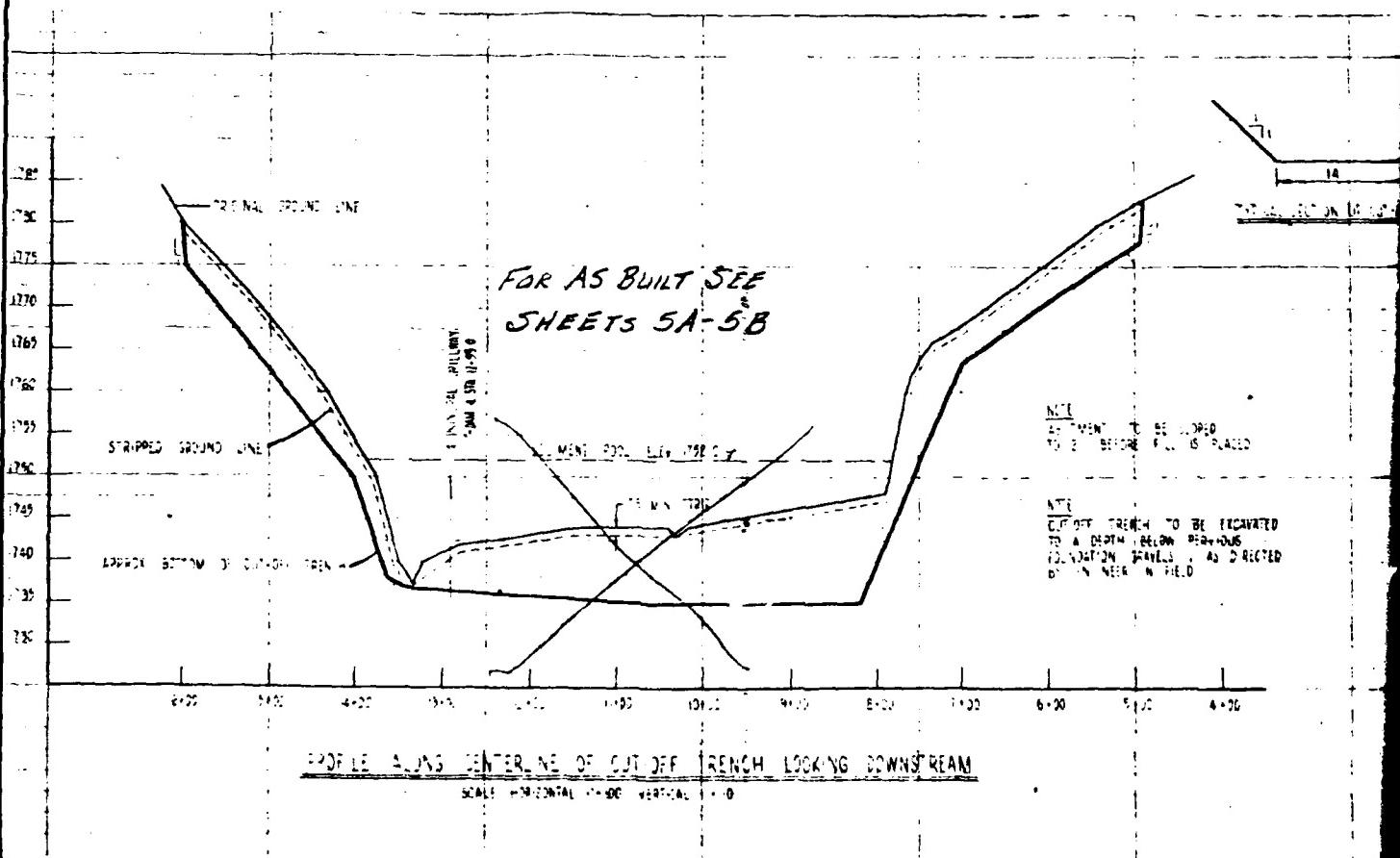
CONSTRUCTION ELEVATIONS



B-5



PLAN
SCALE 1:100



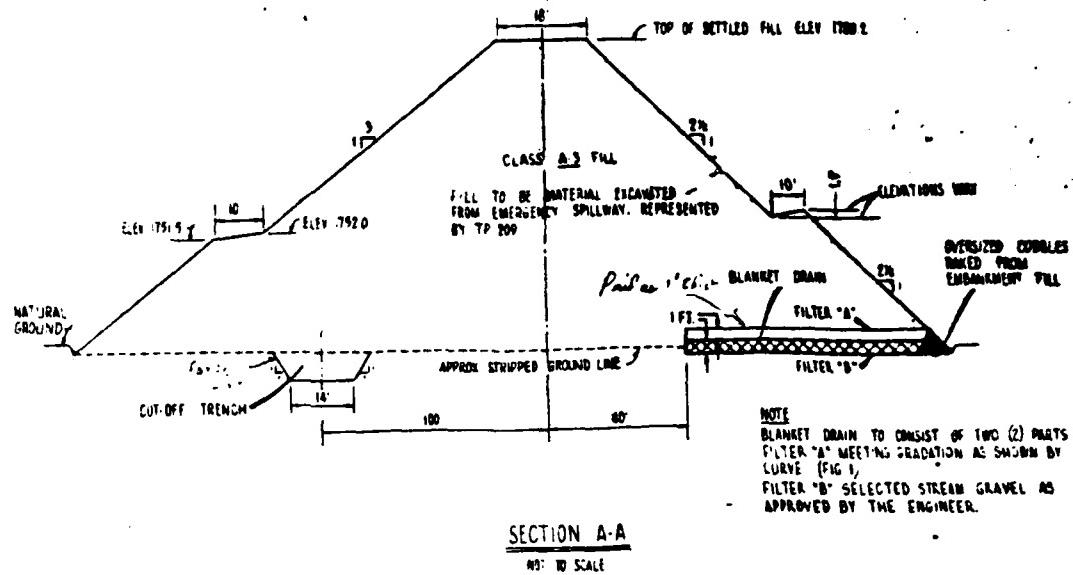
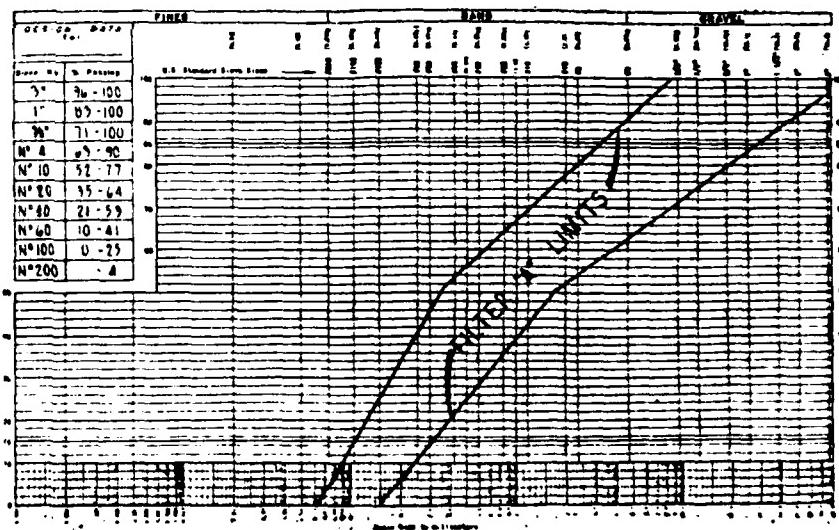


FIG. 1



DO NOT
BE TURNED UNTIL
THE BOTTLE IS PLACED

NOTE
CUT OFF FRENCH TO BE EXCAVATED
TO A DEPTH BELOW PREVIOUS
FOUNDATION PALES AS DIRECTED
BY M. NEER IN FIELD

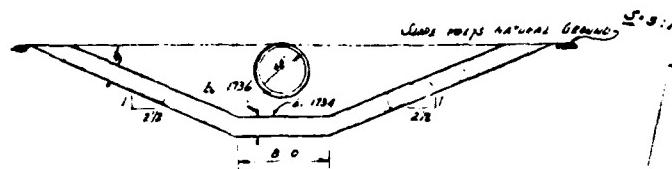
AS BUILT

ISCHUA CREEK WATERSHED PROJECT
FLOODWATER RETARDING DAM NO 5
GATES CREEK
FRANKLINVILLE, NEW YORK
SEEPAGE DRAIN DETAILS

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

B - 6

PLAN VIEW
SCALE 1:20'



SECTION A-A
SCALE 1:10'

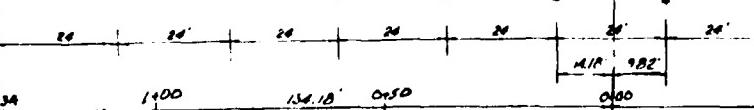
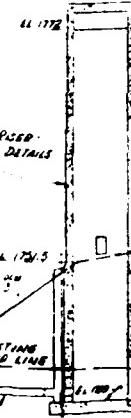
VERTICAL SECTION
ELEVATIONAL SPILLWAY ELEVATION

30" X 74" DIA. ACCELS ACCORDING
TO BE 100% TO BE DEBORACO
ACCORDING TO ARMOCO STD 9, SCHMID
LAYOUT NO. 100328, DATED 6-7-66 OR EQUAL

FOR MEDIUM
CLASS 5-11W 8

REIN CONC PLATE -
TYPE I (SEE DETAILS
SHEET 2)

6" DIA METAL PLATE
WELDED OR BOLTED
TO TOP
10" DIA
2 3/8" DIA B.C.C.D.
ELEVATION
GROUND LINE



SOILS DATA

EL 17304

EL 17313

6'-7" TLL

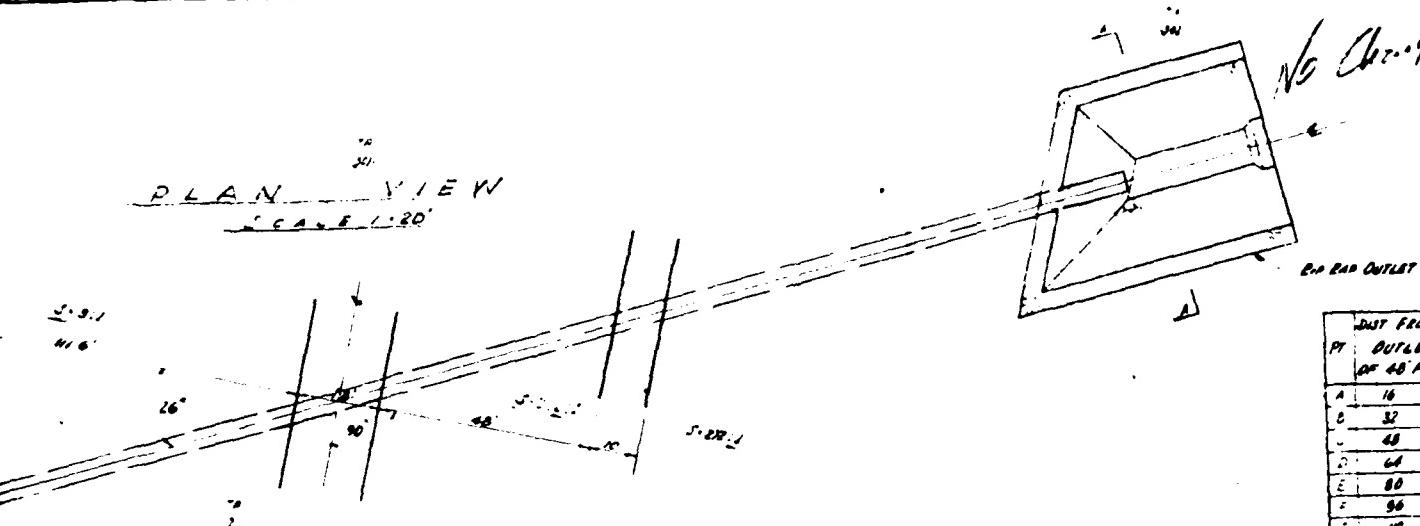
EL 17312

EL 17306

1' TLL

6'-7" TLL

PLAN VIEW
SCALE 1:20'



48" INSIDE DIA CONCRETE WATER PIPE

(A) 16 SECTIONS

(B) 10 SECTION

(C) WALL PIECE FOR 20' WALL

TOTAL = 316'

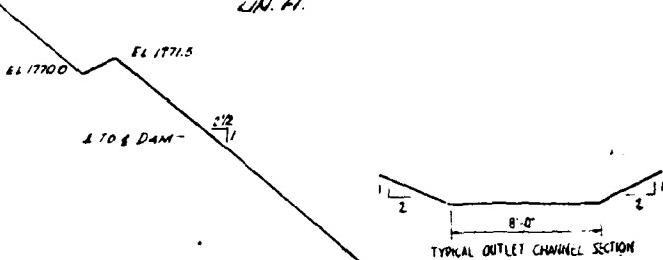
PRESSURE HEAD = 51'

LOAD = 36,000 PER LIN FT. BASED ON J.D. OF 60°
MIN 3 EDGE BEARING STRENGTH FOR .01 CRACK
(NON-PRESTRESSED PIPE) = 16,600 PER LIN FT.
.08 .001 CRACK (PRESTRESSED P.P.E.) = 12,500 PER
LIN FT.

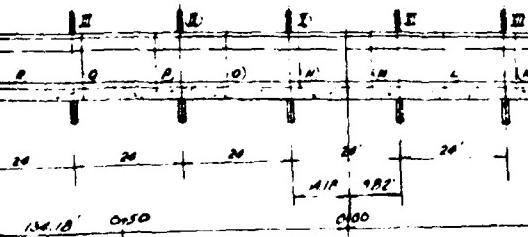
	DIST FROM PT. OF OUTLET OF 48" PIPE	INVERT 48" PIPE
A	16	176.80
B	32	176.42
C	48	176.64
D	64	176.85
E	80	177.15
F	96	177.46
G	112	177.45
H	128	177.65
I	144	177.66
J	160	178.00
K	176	178.10
L	192	178.30
M	208	178.49
N	224	178.61
O	240	178.73
P	256	178.84
Q	272	178.90
R	288	178.97
S	296	178.99
T	314	179.00

I	292	178.97
II	.68	179.88
III	.44	179.74
IV	1.20	179.57
V	.76	179.36
VI	.72	179.07
VII	.16	173.82

NOTE: PIPE LENGTHS ARE NOMINAL
AND DO NOT INCLUDE CREEP.



(C) REIN CONC COLLARS - TYPE II
(SEE DETAILS SHEET 8)



REIN CONC CRADLE - TYPE II
(SEE DETAILS - SHEET 8)

REIN CONC BRANT - TYPE II
(SEE DETAILS SHEET 8)

AS BUILT

PROFILE ALONG E PRINCIPAL SPILLWAY

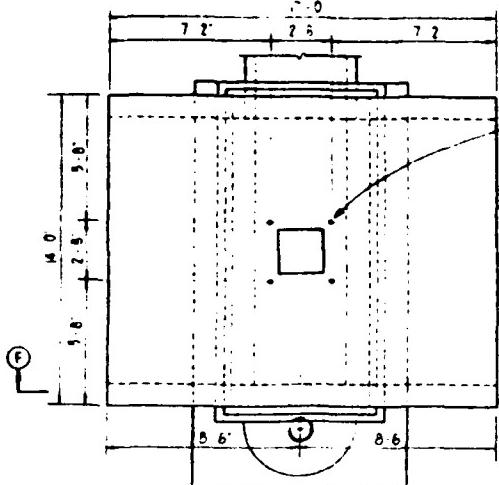
SCALE HOH 1:20'
VERT 1:8'

SEE SHEETS 6A-6B
EXCAV. & BACKFILL
PRINC. SPILLWAY

NOTE

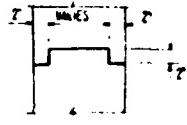
ALL GRAVELS (60), AS REPRESENTED ON THE LOGS OF T.P. 2 & T.P. 302
FROM 1 TO 6, SHALL BE REMOVED FROM UNDER THE CONDUIT & REPLACED
WITH COMMERCIAL FILL (CLASS A-3), IF NECESSARY PRIOR TO PLACEMENT
OF THE CONDUIT.

ISCHUA CREEK WATERSHED PROJECT	
FLOODWATER RETARDING DAM NO 9	
GATES CREEK	
FRANKLINVILLE, NEW YORK	
PLAN-PROFILE OF PRINCIPAL SPILLWAY	
U.S. DEPARTMENT OF AGRICULTURE	
SOIL CONSERVATION SERVICE	
Designed	Date Approved
M.L. WALL	Apr '81
Drawn	1/26/81
B.C. ELIAS	Apr '81
Checked	1/26/81
M. L. WALL	1/26/81
Approved	1/26/81
Charged	Drawing No
SHOEMAKER & FARNUMS	NY-805-6
Charged	Date
SHOEMAKER & FARNUMS	1/26/81
Approved	Date
	1/26/81
B-7	

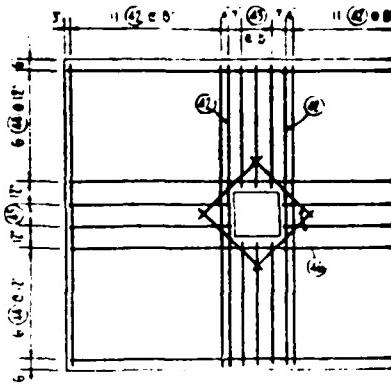


PLAN VIEW

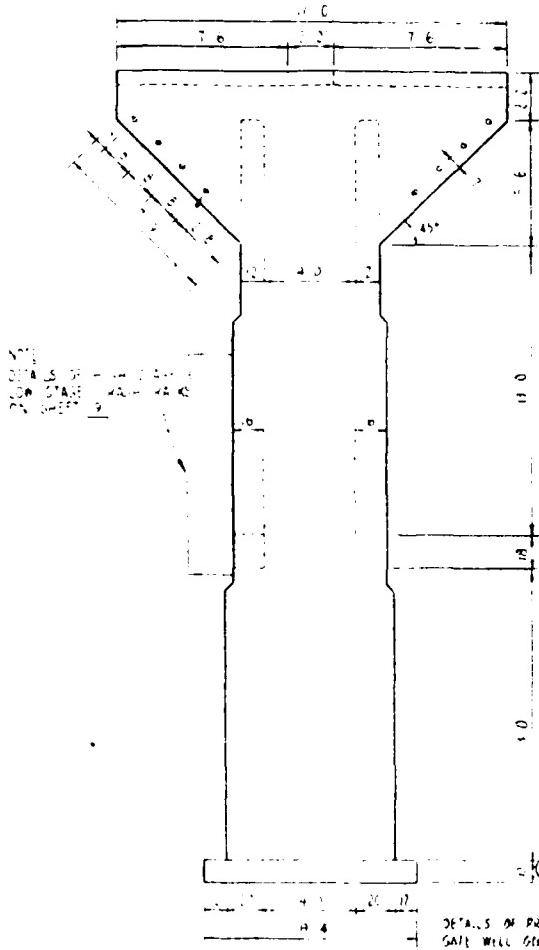
NOTE:
DETAILS OF MANHOLE
ASSEMBLY ON SHEET 9



TYPICAL CONSTRUCTION JOINT

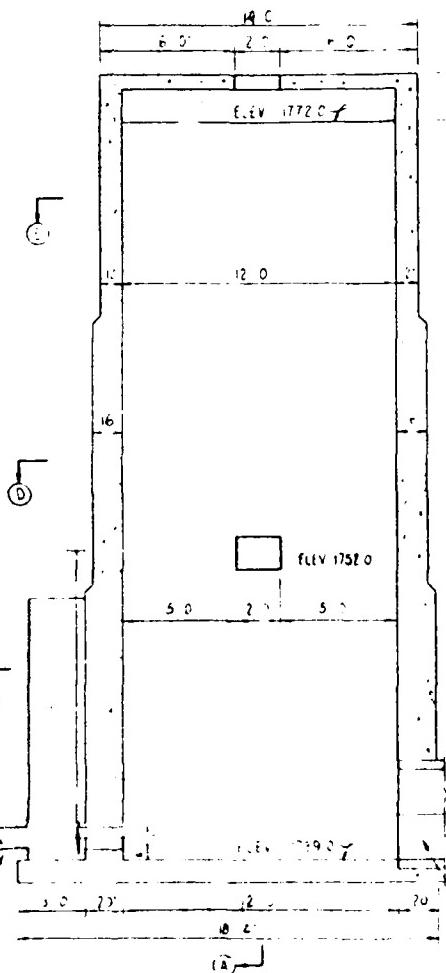


SIDE GATE DETAILS
MOLDED GATE ARMED MODEL 95 DEC OR APPROVED EQUAL
RIMWELL LIFT H-4
OPERATING HEAD 12 FEET
STEM LENGTH 3 FEET
FRAME HEIGHT MINIMUM
BRONZE SEAT FACINGS + LIFT NUTS
LOCATE STEM GUIDES + ANCHOR BOLTS ACCORDING TO
MANUFACTURERS RECOMMENDATIONS

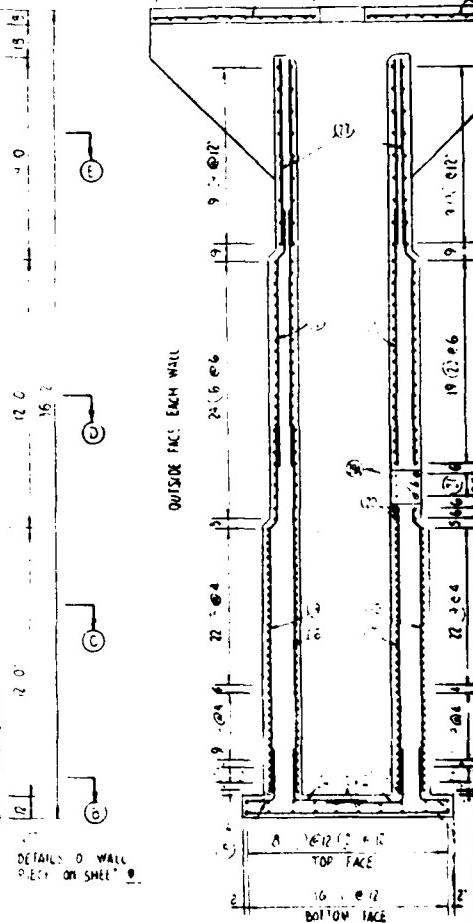


UPSTREAM ELEVATION

DETAILS IN PAPER
GATE WELL SEE
SHEET 9



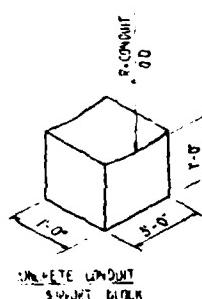
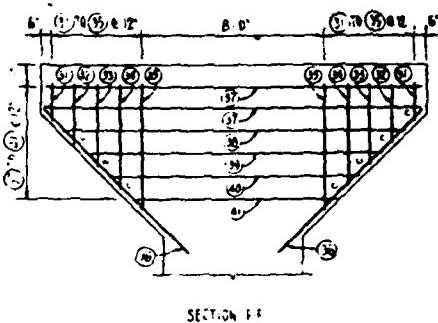
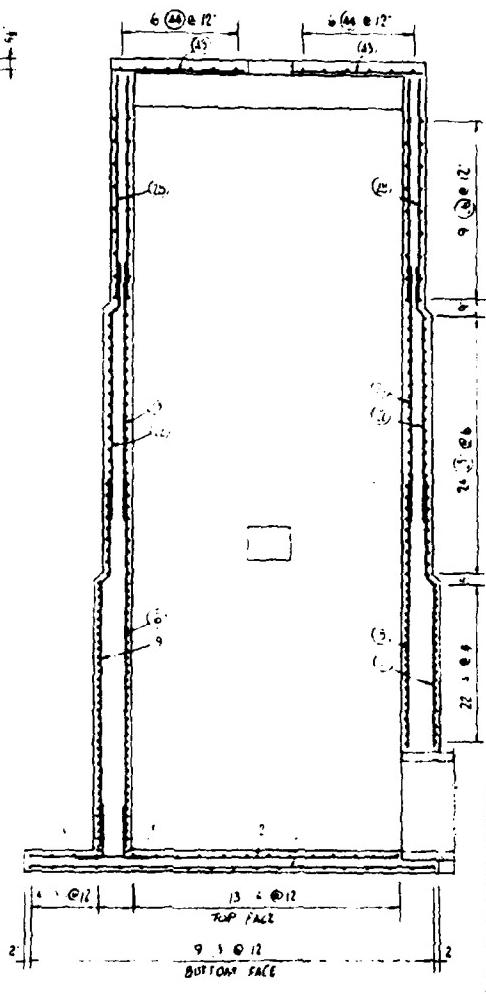
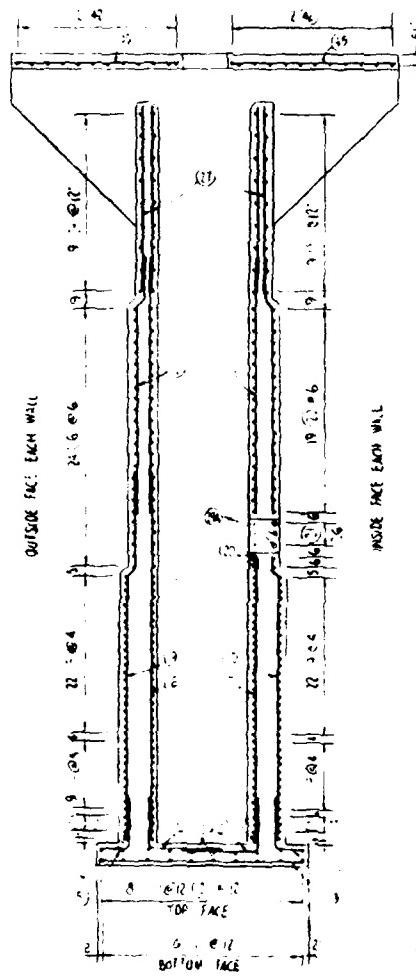
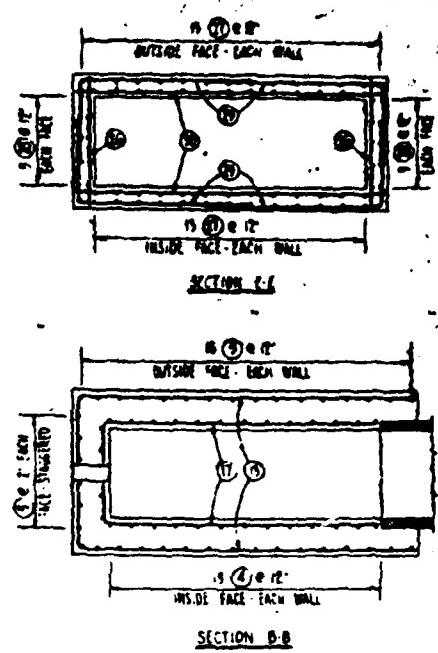
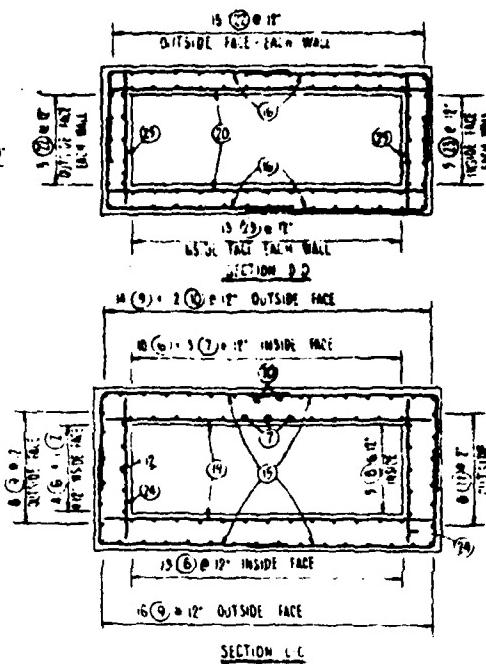
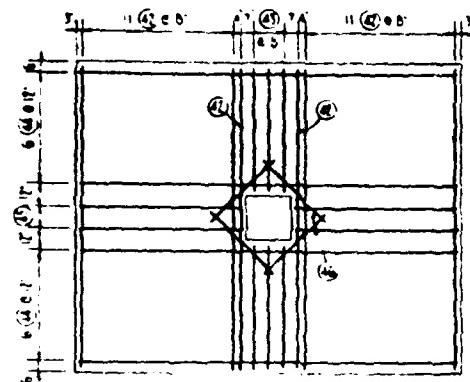
SECTION ON CENTERLINE



SECTION A-A

DETAILS O/WALL
SEE
SHEET 9

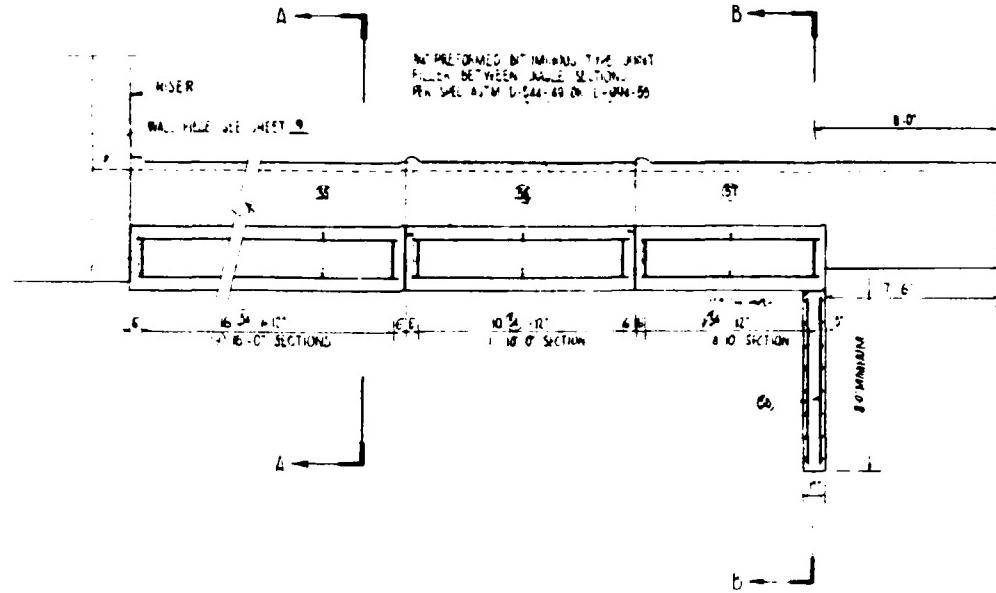
A 16'12" + 10'
TOP FACE
E 16'12"
BOTTOM FACE



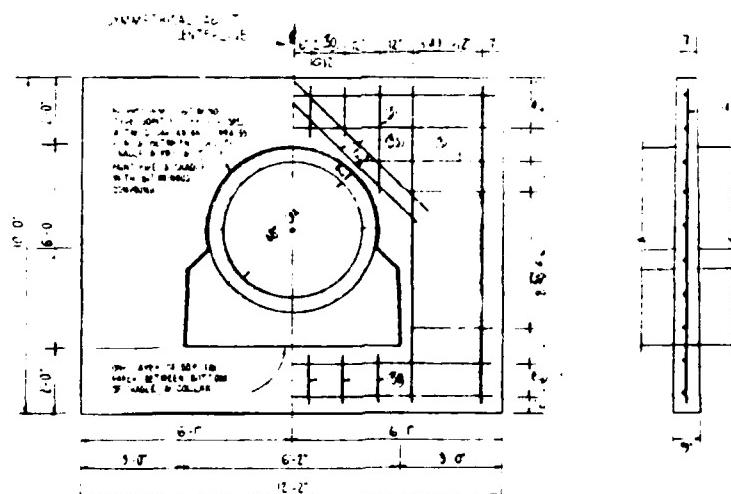
AS BUILT

ISCHUA CREEK WATERSHED PROJECT	
FLOODWATER RETARDING DAM NO 5	
GATES CREEK	
FRANKLINVILLE, NEW YORK	
RISER DETAILS	
U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	
Location Date Owner Title Junction Deck	Date Accepted by Signature Title Signature NY - 805 -

B-8



DETAIL OF REINFORCED CONCRETE CRADLE 6 BLN



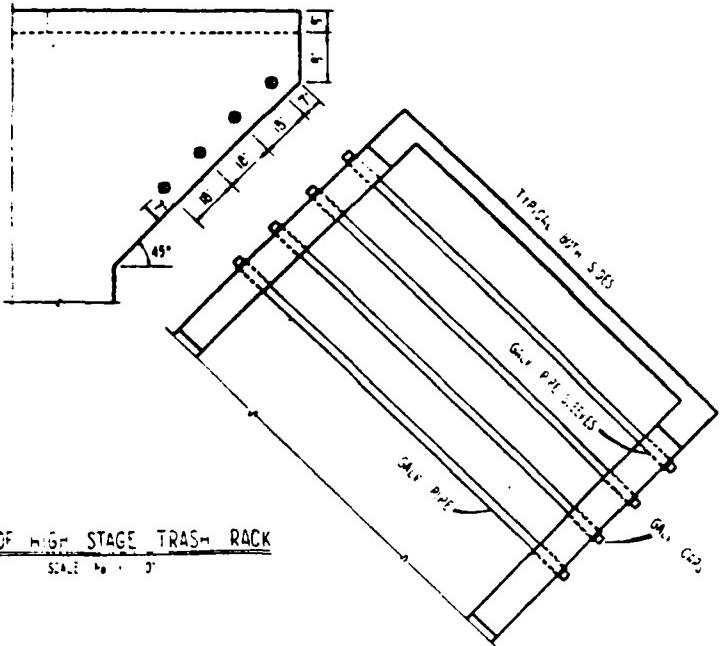
DETAIL OF REINFORCED CONCRETE ANTI-SEEP MARKER - 7 RECDU
SCALE 1/10"

GENERAL NOTES

1. ALL CONCRETE SHALL BE CLASS B OF THE PINT AND CEMENT, TYPE I WITH AN AIR-ENRICHMENT OR TYPE IA, SHALL BE USED.
2. ALL REINFORCING STEEL SHALL BE LAPPED TO 10 BAR DIAMETERS.
3. ALL REINFORCING STEEL, PLACED IN CONCRETE THE GROUND, SHALL HAVE A MINIMUM OF 3" WHERE PONDS ARE USED, BARS SHALL HAVE 2" OF CONCRETE.
4. ALL EXPOSED EDGES OF CONCRETE WALL MUST UNLESS OTHERWISE NOTED.

STEEL SCHEDULE

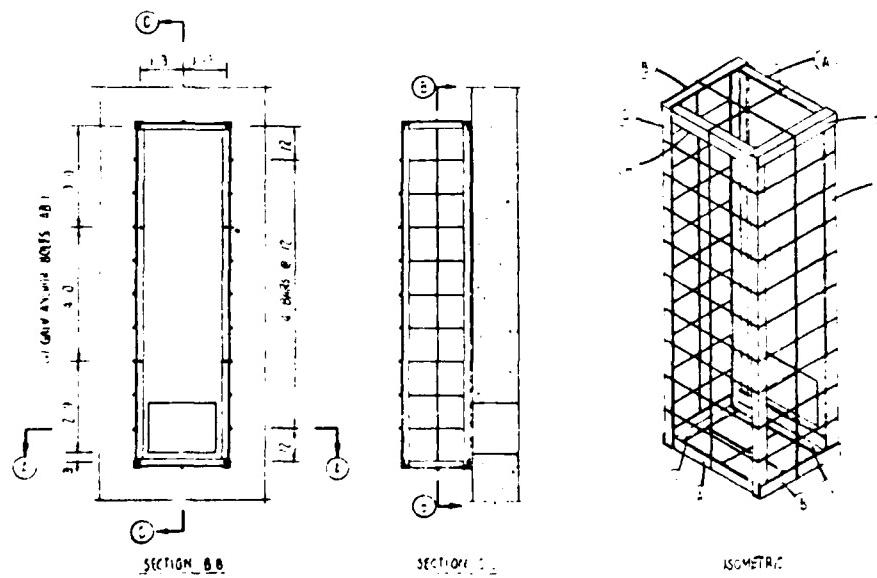
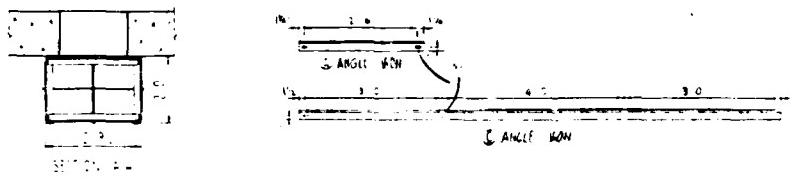
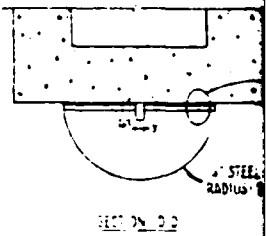
LINE	LOCATION	BAR STEEL	LENGTH	TYPE	A	B	C	TOTAL
1	BUTT CAP	10	5	M-10	-	-	-	50.00
2	-	7	5	M-7	1	-	-	35.00
3	-	7	5	M-7	1	-	-	35.00
4	-	7	5	M-7	1	-	-	35.00
5	-	7	5	M-7	2	2.0	5.0	105.00
6	REF (10' 0" X 10' 0" X 10' 0")	42	6	M-6	2	2.0	1.0	126.00
7	-	7	6	M-6	1	-	-	42.00
8	-	7	6	M-6	1	-	-	42.00
9	(10' 0" X 10' 0")	36	6	M-6	2	1.0	1.0	100.00
10	-	7	6	M-6	2	1.0	1.0	100.00
11	-	7	6	M-6	2	1.0	1.0	100.00
12	ANTI-SHEAR	1	6	M-6	1	-	-	6.00
13	ANTI-SHEAR	1	6	M-6	1	-	-	6.00
14	-	6	6	M-6	2	6.0	6.0	144.00
15	-	6	6	M-6	2	6.0	6.0	144.00
16	-	6	6	M-6	2	6.0	6.0	144.00
17	-	6	6	M-6	2	6.0	6.0	144.00
18	-	6	6	M-6	2	6.0	6.0	144.00
19	ANTI-SHEAR	1	6	M-6	1	-	-	6.00
20	ANTI-SHEAR	1	6	M-6	1	-	-	6.00
21	(10' 0" X 10' 0")	16	6	M-6	1	-	-	96.00
22	-	6	6	M-6	1	-	-	96.00
23	-	6	6	M-6	1	-	-	96.00
24	-	6	6	M-6	1	-	-	96.00
25	-	6	6	M-6	1	-	-	96.00
26	ANTI-SHEAR (10' 0" X 10' 0")	16	6	M-6	1	-	-	96.00
27	-	6	6	M-6	1	-	-	96.00
28	-	6	6	M-6	1	-	-	96.00
29	ANTI-SHEAR (10' 0" X 10' 0")	16	6	M-6	1	-	-	96.00
30	-	6	6	M-6	1	-	-	96.00
31	ANTI-SHEAR	8	3	M-3	1	-	-	24.00
32	-	8	3	M-3	1	-	-	24.00
33	-	8	3	M-3	1	-	-	24.00
34	-	8	3	M-3	1	-	-	24.00
35	-	8	3	M-3	1	-	-	24.00
36	-	8	3	M-3	1	-	-	24.00
37	-	8	3	M-3	1	-	-	24.00
38	-	8	3	M-3	1	-	-	24.00
39	-	8	3	M-3	1	-	-	24.00
40	-	8	3	M-3	1	-	-	24.00
41	ANTI-SHEAR (10' 0" X 10' 0")	16	4	M-4	1	-	-	32.00
42	-	10	4	M-4	1	-	-	32.00
43	-	10	4	M-4	1	-	-	32.00
44	-	10	4	M-4	1	-	-	32.00
45	-	10	4	M-4	1	-	-	32.00
46	-	10	4	M-4	1	-	-	32.00
47	ANTI-SHEAR (10' 0" X 10' 0")	16	4	M-4	1	-	-	32.00
48	-	10	4	M-4	1	-	-	32.00
49	-	10	4	M-4	1	-	-	32.00
50	-	10	4	M-4	1	-	-	32.00
51	ANTI-SHEAR	8	3	M-3	1	-	-	24.00
52	-	8	3	M-3	1	-	-	24.00
53	-	8	3	M-3	1	-	-	24.00
54	-	8	3	M-3	1	-	-	24.00
55	-	8	3	M-3	1	-	-	24.00
56	-	8	3	M-3	1	-	-	24.00
57	-	8	3	M-3	1	-	-	24.00
58	CRADLE	933	4	M-4	1	-	-	32.00
59	-	76	4	M-4	1	-	-	32.00
60	-	4	4	M-4	1	-	-	32.00
61	-	14	4	M-4	1	-	-	32.00
62	-	14	4	M-4	1	-	-	32.00
63	-	14	4	M-4	1	-	-	32.00
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66	-	14	4	M-4	1	-	-	32.00
67	-	14	4	M-4	1	-	-	32.00
68	CRADLE	933	4	M-4	1	-	-	32.00
69	-	76	4	M-4	1	-	-	32.00
70	-	4	4	M-4	1	-	-	32.00
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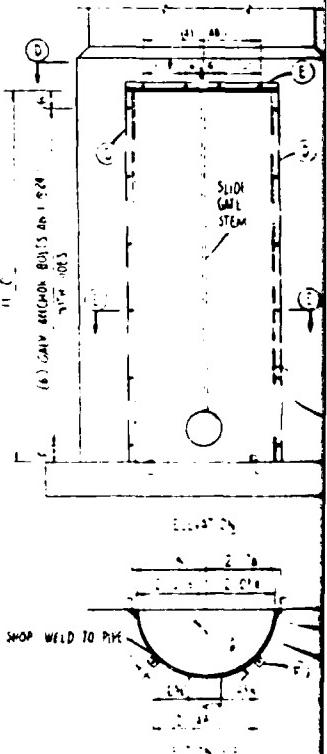
DETAILS OF HIGH STAGE TRASH RACK

SCALE 1:10'

DETAIL OF REINFORCE CONCRETE WATER PIPE



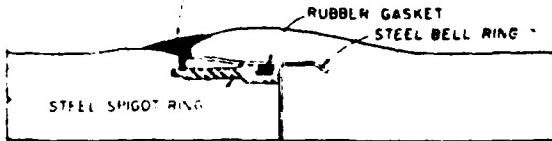
DETAILS OF LOW STAGE TRASH RACK



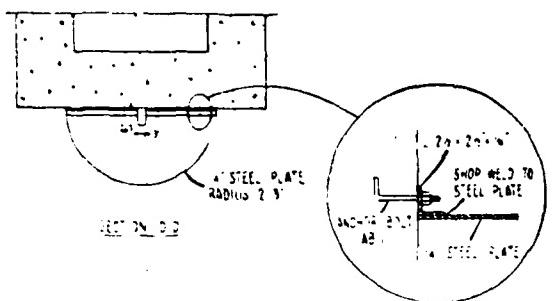
DETAILS OF GATE WE



PACK WITH DRY JUTE, THEN
SEAL WITH COLD APPLIED ASPHALTIC
CEMENT, COMMERCIAL GRADE

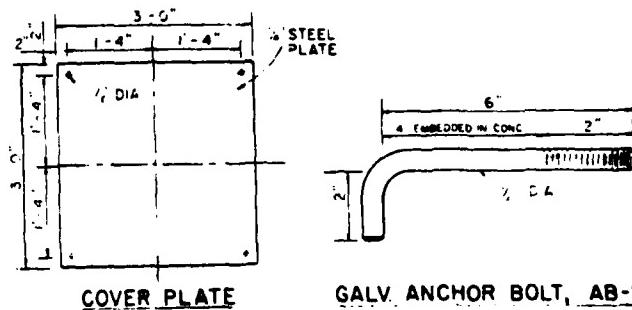
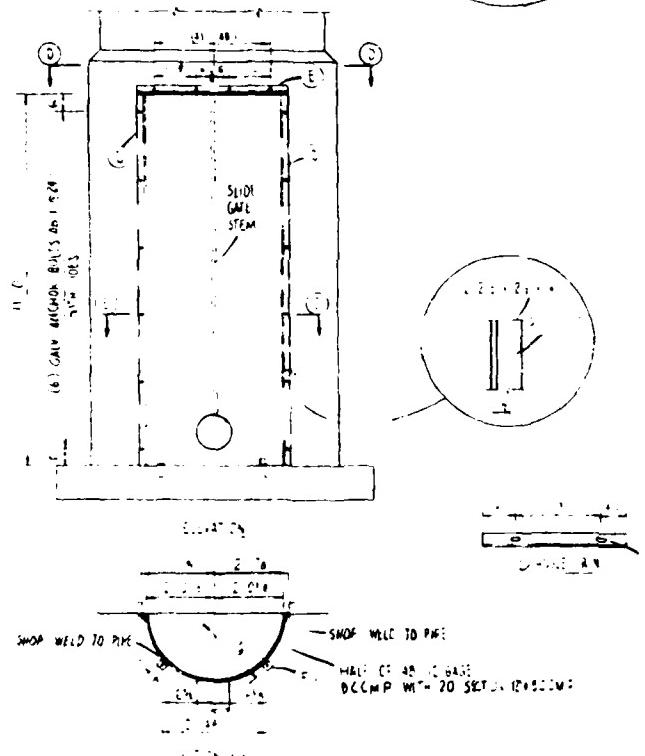


DETAIL OF REINFORCED CONCRETE WATER PIPE JOINT



The diagram illustrates a cross-section of a concrete wall section. At the top, a 'WATER STOP AND STIFFENER RING' is shown, with a note indicating it should be 'PACK WITH DRY JUTE THEN SEAL WITH COLD APPLIED ASPHALTIC CEMENT, COMMERCIAL GRADE'. Below this, a 'STEEL CYLINDER' is positioned. A 'RUBBER GASKET' and a 'STEEL BELL RING' are used to secure the cylinder. The wall thickness is labeled as '20''. A 'STEEL SPIGOT RING' is also present. The floor level is marked as 'RISER FLOOR'. On the left side, there is a note: 'FILL WITH MORTAR ALONG FLOOR AND SIDE WALLS'. At the bottom, a 'PREFORMED BITUMENIC TYPE JOINT FILLER BETWEEN CRADLE AND RISER (ASTM D-994-53 OR ASTM D-544-49)' is shown, with dimensions of '2'' and '1/2''. A 'CRADLE' is depicted at the very bottom.

DETAIL OF WALL PIECE IN RISER

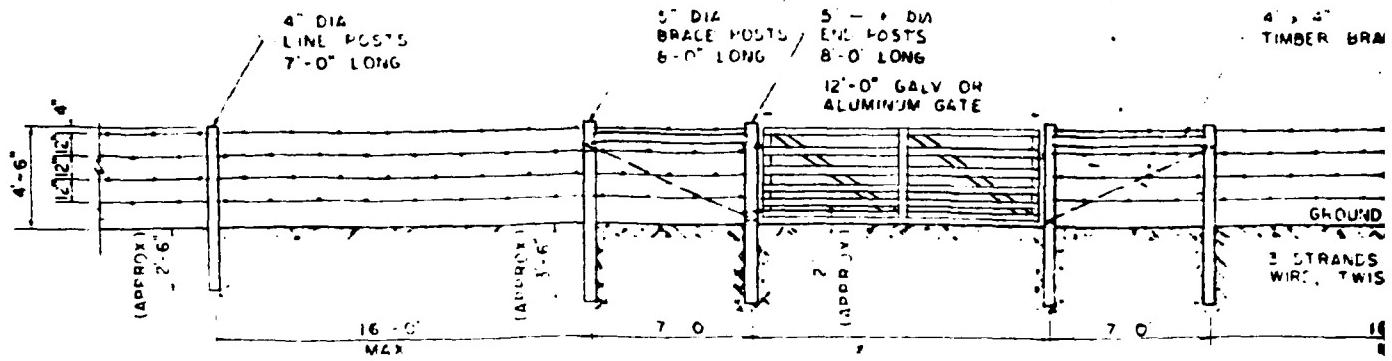


MANHOLE ASSEMBLY

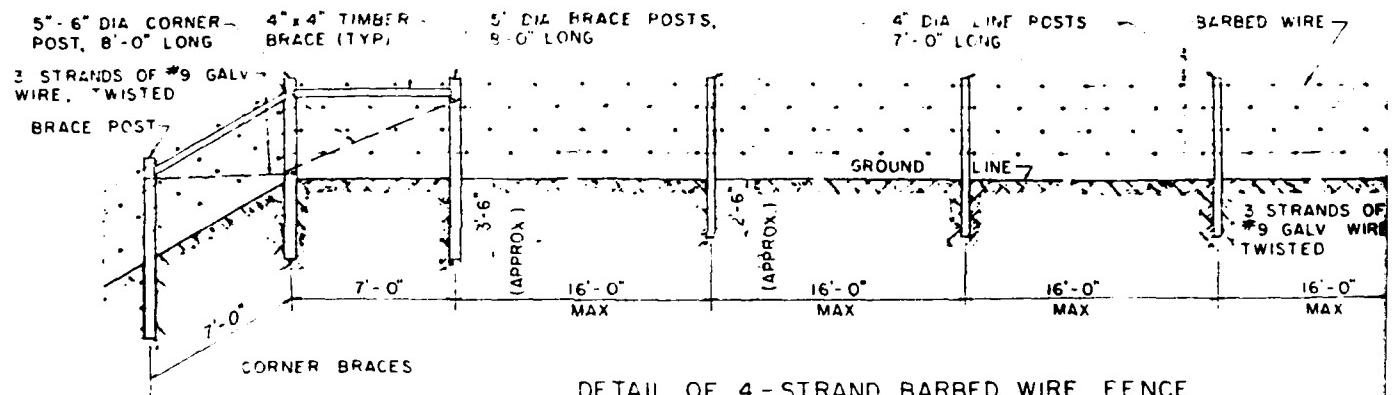
DETAILS OF CATE WELL

ISCHUA CREEK WATERSHED PROJECT
FLOODWATER RETARDING DAM NO 5
BATES CREEK
FRANKLINVILLE, NEW YORK
GATE WELL, TRASH RACKS & MISC. DETAILS
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

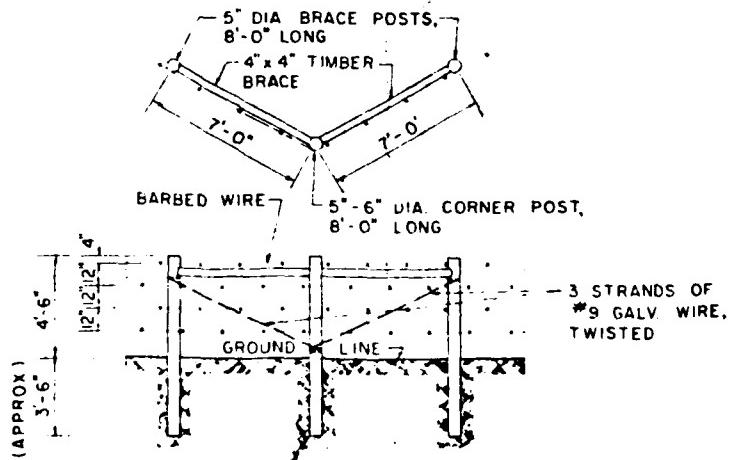
NY- 805



TYPICAL GATE SECTION



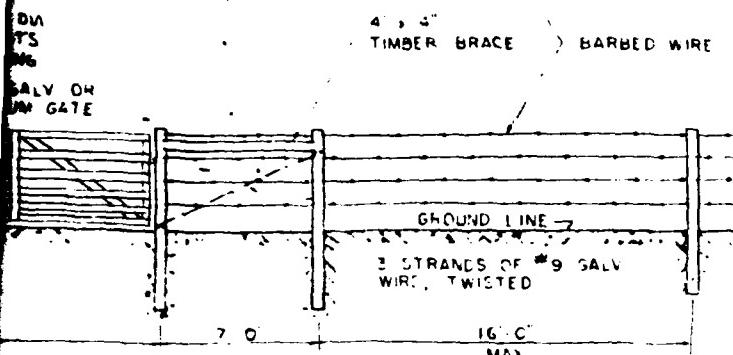
DETAIL OF 4-STRAND BARBED WIRE FENCE



TYPICAL CORNER
AND DIRECTION CHANGE BRACING

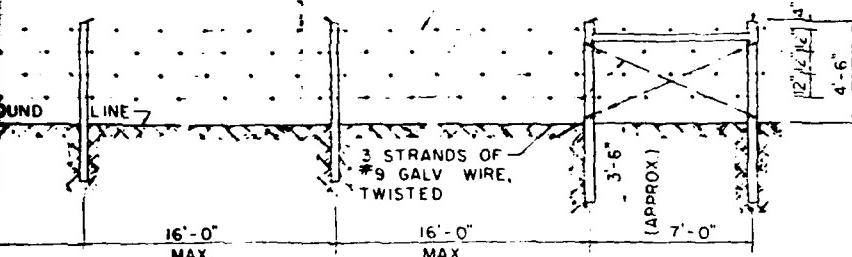
NOTES

- 1 ALL POSTS AND BRACES PRESSURE TREATED WITH CREOSOTE
- 2 BRACE POSTS, MAXIMUM SPACING 7'-0" CENTER TO CENTER
- 3 LINE POSTS, MAXIMUM SPACING 16'-0" CENTER TO CENTER
- 4 STEEL POSTS MAY BE SUBSTITUTED FOR LINE POSTS.
- 5 NOTCH POSTS $\frac{3}{4}$ INCH FOR TIMBER BRACE



GATE SECTION

4" DIA LINE POSTS — BARBED WIRE — 5" DIA BRACE POSTS —
7'-0" LONG 8'-0" LONG



LINE BRACES

BARBED WIRE FENCE

POST.

— 3 STRANDS OF
#9 GALV WIRE,
TWISTED

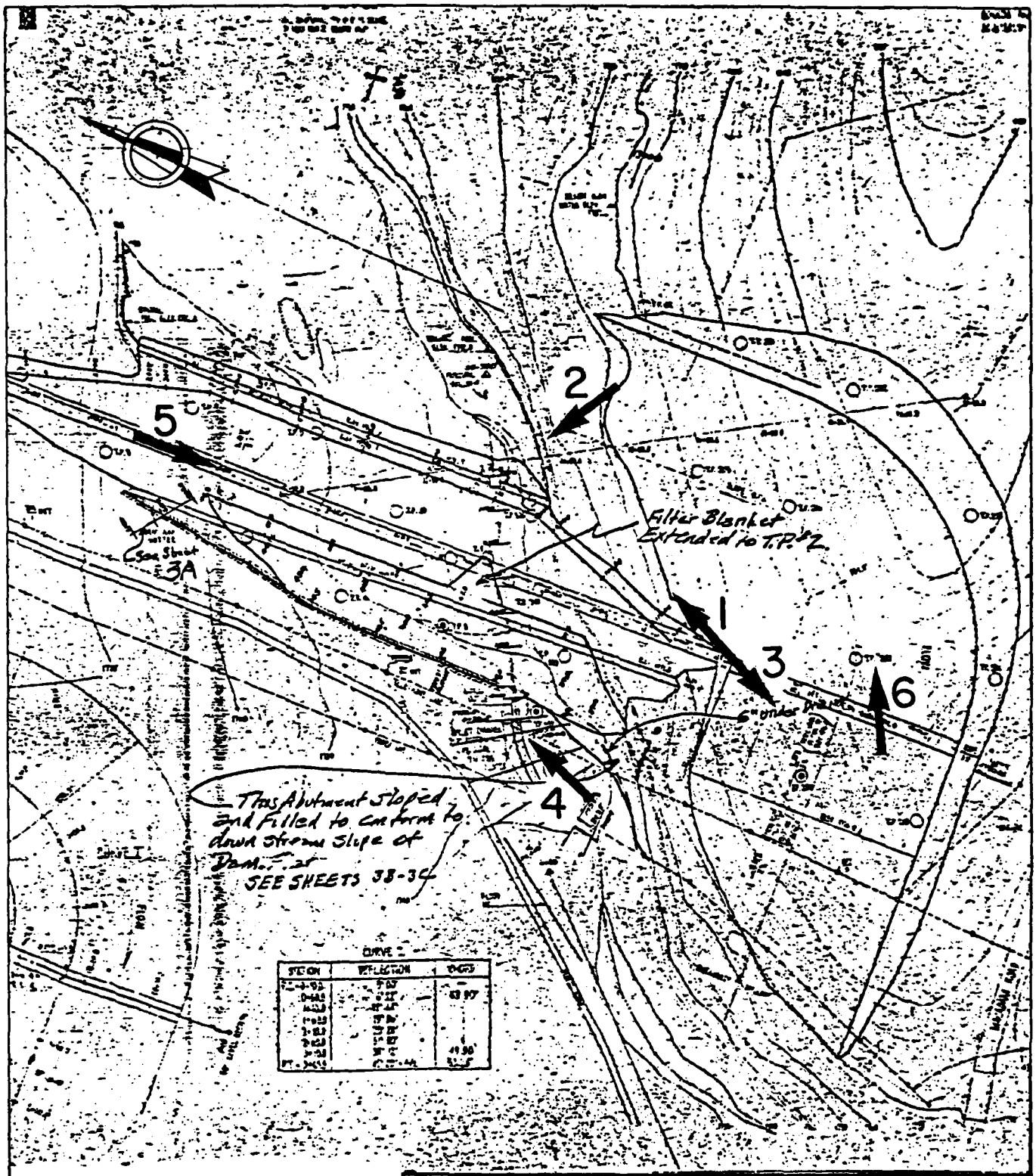
AS BUILT

FENCE DETAILS		
ISCHUA CREEK WATERSHED PROJECT		
FLOODWATER RETARDING DAM NO 5		
GATES CREEK		
FRANKLINVILLE, NEW YORK		
U. S. DEPARTMENT OF AGRICULTURE		
SOIL CONSERVATION SERVICE		
Designed by	Date	Approved by
Wm. A. ALLABAND		Title
Arch.		
CHAS. B. FORD	5-31-60	
Engine.		
NORMAN W. WILSON	5-12-60	No ID
		NY - 805

B-11

APPENDIX C

PHOTOGRAPHS



ISCHUA CREEK WATERSHED DAM #5

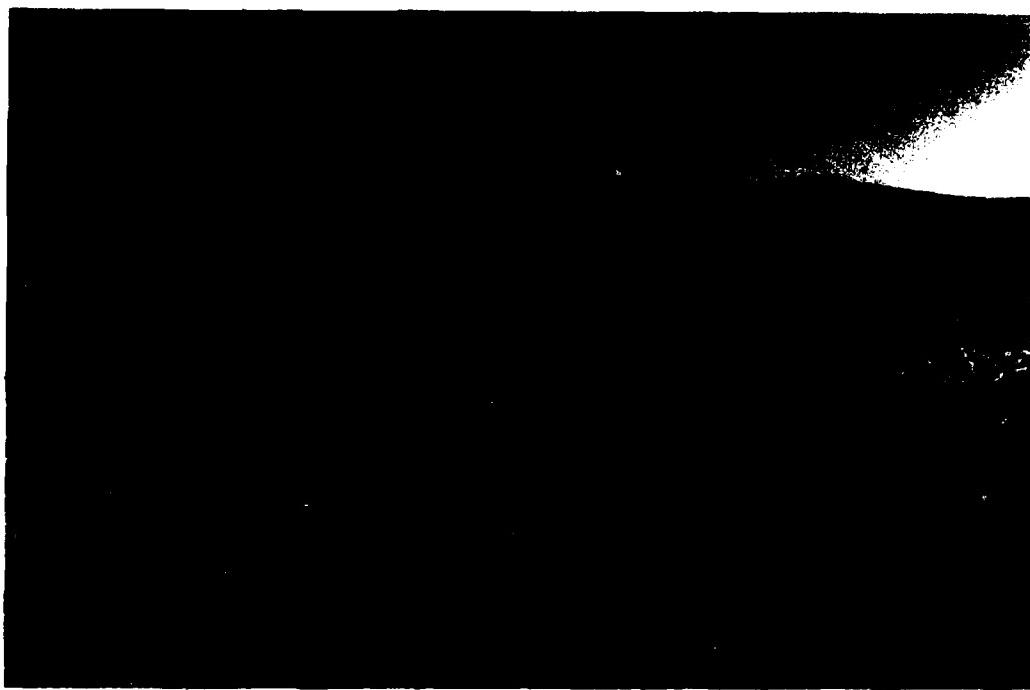
NY00565

PHOTO ORIENTATION PLAN

ERDMAN, ANTHONY, ASSOCIATES
CONSULTING ENGINEERS & PLANNERS

DATE
MAY 1981

C-1



1. Principal spillway inlet structure and impoundment



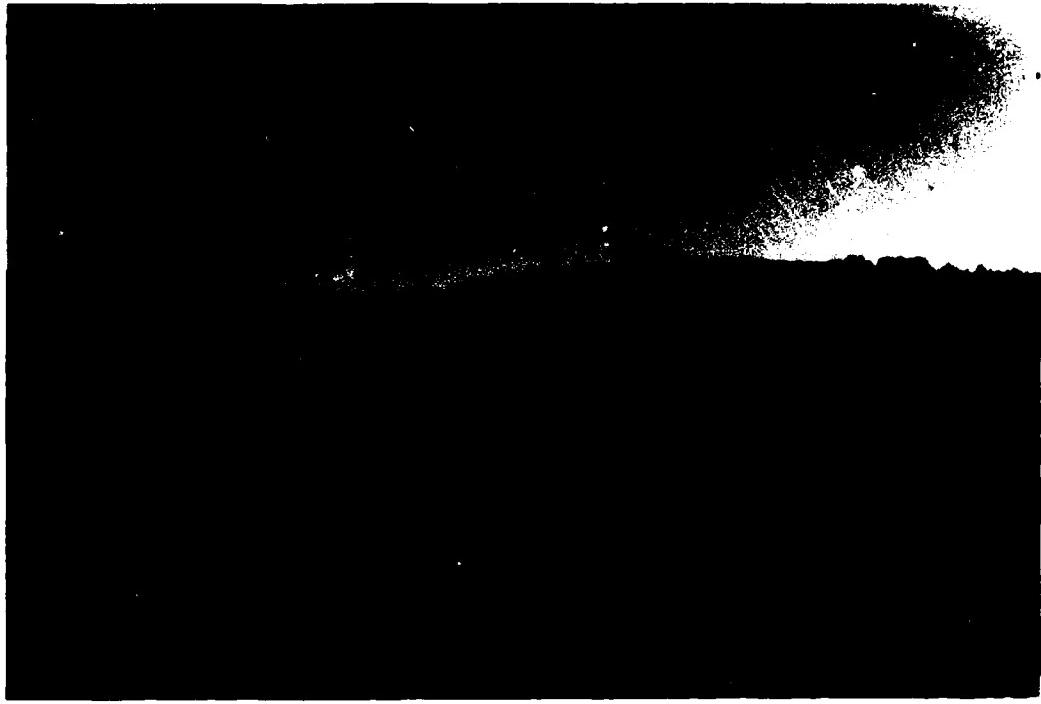
2. Principal spillway inlet structure and upstream face of dam



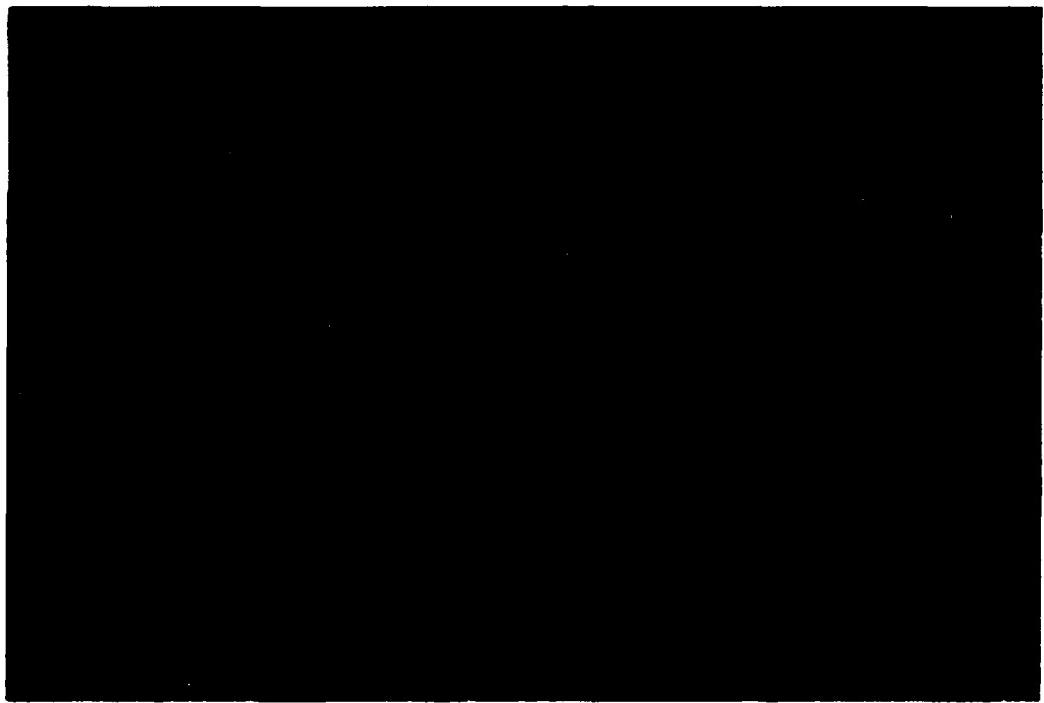
3. Emergency spillway



4. Principal spillway outlet pipe and plunge pool



5. Crest of dam



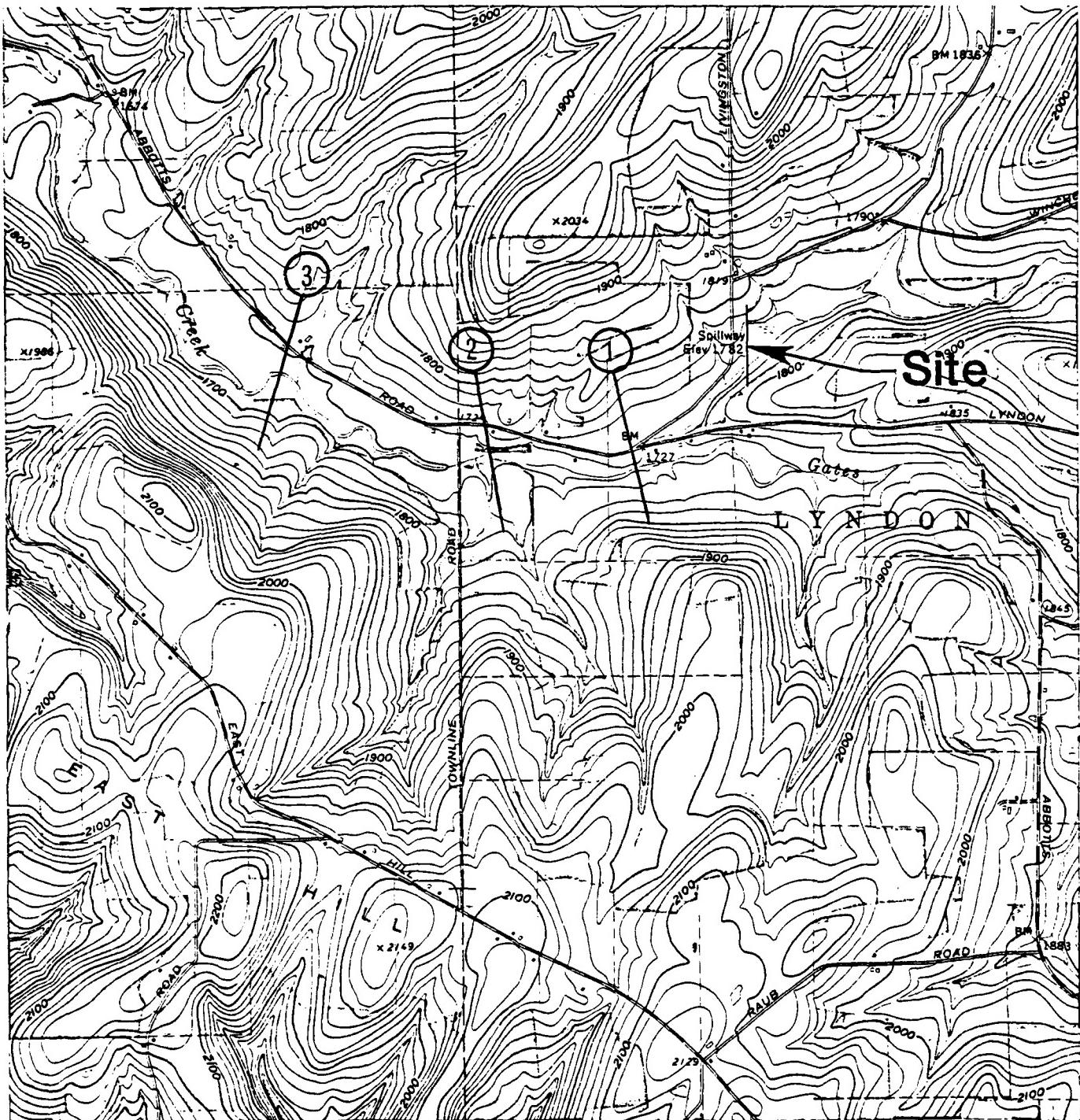
6. Emergency spillway

APPENDIX D

HYDRAULIC AND HYDROLOGIC COMPUTATIONS

APPENDIX D

	<u>PAGE</u>
Cross Section Location Plan	D-2
HEC-1 Dam Safety Version Computer Program - Input	D-3
HEC-1 Dam Safety Version Computer Program - Output	D-5
Supporting Calculations	
• Hydrology	D-14
• Spillway Hydraulics	D-19
• Downstream Channel Routing	D-29



Ischua Creek Watershed Dam No. 5

CROSS SECTION LOCATION PLAN

Scale: 1"-2000'

DAM AY 565

A1 ANALYSIS OF DAM OVERTOPPING USING RATIOS OF PPF
A2 HYDROLOGIC-HYDRAULIC ANALYSIS OF SAFETY OF ISCHUA CREEK DAM NO. 5
A3 RATIOS OF PPF ACUTED THROUGH THE RESERVOIR AND DOWNSTREAM

H	100	15	-1	4
H1	5			
Y	1	6	1	
Y1	0.2	0.4	0.5	0.6
X	0.5	INFLOW	0	1
X1	CALCULATION OF INFLOW HYDROGRAPH TO RESERVOIR			
M	1	1	6.4	0
P	2	22.5	117	127
T			141	151
U	3.45	0.63		
V	2.0	-0.10	2.0	
K	OUTFLOW			
K1	CALCULATION OF OUTFLOW HYDROGRAPH FROM RESERVOIR			
Y	1		1	
Y1	1	1775	1778	1780.6
Y4	1772	1780	1789	1790.2
Y4	1787	1788	1789	1790
Y5	6.4	145	270	305
Y5	12607	16824	21226	22137
S5	0	45	470	926
SE	1739	1752	1772	1780.6
I5	1782		1.5	1360
361789.2				
K	1	A		
K1	CHANNEL ROUTING - MOD PULS RESERVOIR - A			
Y	1		1	
Y1	1			
Y6	0.08	0.04	0.04	1719
Y7	2	1780	150	1760
Y7	6.95	1725	1796	1760
K	GATES			
K1	CALCULATE GATES CREEK HYDROGRAPH			
M	1	1	6.64	13.04
P	22.5	114	124	138
T			148	
U	4.11	0.63		
V	2	-0.1	2	
K	CORRECT OUTFLWS FROM DAM 565 WITH RUNOFF FROM GATES CREEK			
K1	1			
K1	CHANNEL ROUTING - MOD PULS A-1			
Y	1		1	
Y1	1			
Y6	0.08	0.04	0.04	1719
Y7	6	1780	150	1760
Y7	7.25	1725	1796	1760
K	1	2		
K1	CHANNEL ROUTING - MOD PULS PTACH 1-2			
Y	1		1	
Y1	1			
Y6	0.04	0.04	0.04	1719
Y7	0	1750	675	665
Y7	9.00	1710	665	1710
K	1			

CHARACTER ROUTINE - MOL PULS REACH 2~3

	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17	Y18	Y19	Y20	Y21	Y22	Y23	Y24	Y25	Y26	Y27	Y28	Y29	Y30	Y31	Y32	Y33	Y34	Y35	Y36	Y37	Y38	Y39	Y40	Y41	Y42	Y43	Y44	Y45	Y46	Y47	Y48	Y49	Y50	Y51	Y52	Y53	Y54	Y55	Y56	Y57	Y58	Y59	Y60	Y61	Y62	Y63	Y64	Y65	Y66	Y67	Y68	Y69	Y70	Y71	Y72	Y73	Y74	Y75	Y76	Y77	Y78	Y79	Y80	Y81	Y82	Y83	Y84	Y85	Y86	Y87	Y88	Y89	Y90	Y91	Y92	Y93	Y94	Y95	Y96	Y97	Y98	Y99	Y100	Y101	Y102	Y103	Y104	Y105	Y106	Y107	Y108	Y109	Y110	Y111	Y112	Y113	Y114	Y115	Y116	Y117	Y118	Y119	Y120	Y121	Y122	Y123	Y124	Y125	Y126	Y127	Y128	Y129	Y130	Y131	Y132	Y133	Y134	Y135	Y136	Y137	Y138	Y139	Y140	Y141	Y142	Y143	Y144	Y145	Y146	Y147	Y148	Y149	Y150	Y151	Y152	Y153	Y154	Y155	Y156	Y157	Y158	Y159	Y160	Y161	Y162	Y163	Y164	Y165	Y166	Y167	Y168	Y169	Y170	Y171	Y172	Y173	Y174	Y175	Y176	Y177	Y178	Y179	Y180	Y181	Y182	Y183	Y184	Y185	Y186	Y187	Y188	Y189	Y190	Y191	Y192	Y193	Y194	Y195	Y196	Y197	Y198	Y199	Y200	Y201	Y202	Y203	Y204	Y205	Y206	Y207	Y208	Y209	Y210	Y211	Y212	Y213	Y214	Y215	Y216	Y217	Y218	Y219	Y220	Y221	Y222	Y223	Y224	Y225	Y226	Y227	Y228	Y229	Y230	Y231	Y232	Y233	Y234	Y235	Y236	Y237	Y238	Y239	Y240	Y241	Y242	Y243	Y244	Y245	Y246	Y247	Y248	Y249	Y250	Y251	Y252	Y253	Y254	Y255	Y256	Y257	Y258	Y259	Y260	Y261	Y262	Y263	Y264	Y265	Y266	Y267	Y268	Y269	Y270	Y271	Y272	Y273	Y274	Y275	Y276	Y277	Y278	Y279	Y280	Y281	Y282	Y283	Y284	Y285	Y286	Y287	Y288	Y289	Y290	Y291	Y292	Y293	Y294	Y295	Y296	Y297	Y298	Y299	Y300	Y301	Y302	Y303	Y304	Y305	Y306	Y307	Y308	Y309	Y310	Y311	Y312	Y313	Y314	Y315	Y316	Y317	Y318	Y319	Y320	Y321	Y322	Y323	Y324	Y325	Y326	Y327	Y328	Y329	Y330	Y331	Y332	Y333	Y334	Y335	Y336	Y337	Y338	Y339	Y340	Y341	Y342	Y343	Y344	Y345	Y346	Y347	Y348	Y349	Y350	Y351	Y352	Y353	Y354	Y355	Y356	Y357	Y358	Y359	Y360	Y361	Y362	Y363	Y364	Y365	Y366	Y367	Y368	Y369	Y370	Y371	Y372	Y373	Y374	Y375	Y376	Y377	Y378	Y379	Y380	Y381	Y382	Y383	Y384	Y385	Y386	Y387	Y388	Y389	Y390	Y391	Y392	Y393	Y394	Y395	Y396	Y397	Y398	Y399	Y400	Y401	Y402	Y403	Y404	Y405	Y406	Y407	Y408	Y409	Y410	Y411	Y412	Y413	Y414	Y415	Y416	Y417	Y418	Y419	Y420	Y421	Y422	Y423	Y424	Y425	Y426	Y427	Y428	Y429	Y430	Y431	Y432	Y433	Y434	Y435	Y436	Y437	Y438	Y439	Y440	Y441	Y442	Y443	Y444	Y445	Y446	Y447	Y448	Y449	Y450	Y451	Y452	Y453	Y454	Y455	Y456	Y457	Y458	Y459	Y460	Y461	Y462	Y463	Y464	Y465	Y466	Y467	Y468	Y469	Y470	Y471	Y472	Y473	Y474	Y475	Y476	Y477	Y478	Y479	Y480	Y481	Y482	Y483	Y484	Y485	Y486	Y487	Y488	Y489	Y490	Y491	Y492	Y493	Y494	Y495	Y496	Y497	Y498	Y499	Y500	Y501	Y502	Y503	Y504	Y505	Y506	Y507	Y508	Y509	Y510	Y511	Y512	Y513	Y514	Y515	Y516	Y517	Y518	Y519	Y520	Y521	Y522	Y523	Y524	Y525	Y526	Y527	Y528	Y529	Y530	Y531	Y532	Y533	Y534	Y535	Y536	Y537	Y538	Y539	Y540	Y541	Y542	Y543	Y544	Y545	Y546	Y547	Y548	Y549	Y550	Y551	Y552	Y553	Y554	Y555	Y556	Y557	Y558	Y559	Y560	Y561	Y562	Y563	Y564	Y565	Y566	Y567	Y568	Y569	Y570	Y571	Y572	Y573	Y574	Y575	Y576	Y577	Y578	Y579	Y580	Y581	Y582	Y583	Y584	Y585	Y586	Y587	Y588	Y589	Y590	Y591	Y592	Y593	Y594	Y595	Y596	Y597	Y598	Y599	Y600	Y601	Y602	Y603	Y604	Y605	Y606	Y607	Y608	Y609	Y610	Y611	Y612	Y613	Y614	Y615	Y616	Y617	Y618	Y619	Y620	Y621	Y622	Y623	Y624	Y625	Y626	Y627	Y628	Y629	Y630	Y631	Y632	Y633	Y634	Y635	Y636	Y637	Y638	Y639	Y640	Y641	Y642	Y643	Y644	Y645	Y646	Y647	Y648	Y649	Y650	Y651	Y652	Y653	Y654	Y655	Y656	Y657	Y658	Y659	Y660	Y661	Y662	Y663	Y664	Y665	Y666	Y667	Y668	Y669	Y670	Y671	Y672	Y673	Y674	Y675	Y676	Y677	Y678	Y679	Y680	Y681	Y682	Y683	Y684	Y685	Y686	Y687	Y688	Y689	Y690	Y691	Y692	Y693	Y694	Y695	Y696	Y697	Y698	Y699	Y700	Y701	Y702	Y703	Y704	Y705	Y706	Y707	Y708	Y709	Y710	Y711	Y712	Y713	Y714	Y715	Y716	Y717	Y718	Y719	Y720	Y721	Y722	Y723	Y724	Y725	Y726	Y727	Y728	Y729	Y730	Y731	Y732	Y733	Y734	Y735	Y736	Y737	Y738	Y739	Y740	Y741	Y742	Y743	Y744	Y745	Y746	Y747	Y748	Y749	Y750	Y751	Y752	Y753	Y754	Y755	Y756	Y757	Y758	Y759	Y760	Y761	Y762	Y763	Y764	Y765	Y766	Y767	Y768	Y769	Y770	Y771	Y772	Y773	Y774	Y775	Y776	Y777	Y778	Y779	Y780	Y781	Y782	Y783	Y784	Y785	Y786	Y787	Y788	Y789	Y790	Y791	Y792	Y793	Y794	Y795	Y796	Y797	Y798	Y799	Y800	Y801	Y802	Y803	Y804	Y805	Y806	Y807	Y808	Y809	Y810	Y811	Y812	Y813	Y814	Y815	Y816	Y817	Y818	Y819	Y820	Y821	Y822	Y823	Y824	Y825	Y826	Y827	Y828	Y829	Y830	Y831	Y832	Y833	Y834	Y835	Y836	Y837	Y838	Y839	Y840	Y841	Y842	Y843	Y844	Y845	Y846	Y847	Y848	Y849	Y850	Y851	Y852	Y853	Y854	Y855	Y856	Y857	Y858	Y859	Y860	Y861	Y862	Y863	Y864	Y865	Y866	Y867	Y868	Y869	Y870	Y871	Y872	Y873	Y874	Y875	Y876	Y877	Y878	Y879	Y880	Y881	Y882	Y883	Y884	Y885	Y886	Y887	Y888	Y889	Y890	Y891	Y892	Y893	Y894	Y895	Y896	Y897	Y898	Y899	Y900	Y901	Y902	Y903	Y904	Y905	Y906	Y907	Y908	Y909	Y910	Y911	Y912	Y913	Y914	Y915	Y916	Y917	Y918	Y919	Y920	Y921	Y922	Y923	Y924	Y925	Y926	Y927	Y928	Y929	Y930	Y931	Y932	Y933	Y934	Y935	Y936	Y937	Y938	Y939	Y940	Y941	Y942	Y943	Y944	Y945	Y946	Y947	Y948	Y949	Y950	Y951	Y952	Y953	Y954	Y955	Y956	Y957	Y958	Y959	Y960	Y961	Y962	Y963	Y964	Y965	Y966	Y967	Y968	Y969	Y970	Y971	Y972	Y973	Y974	Y975	Y976	Y977	Y978	Y979	Y980	Y981	Y982	Y983	Y984	Y985	Y986	Y987	Y988	Y989	Y990	Y991	Y992	Y993	Y994	Y995	Y996	Y997	Y998	Y999	Y1000
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OK. SEG #HEC108

ENTER PROJECT NUMBER
801K6-00-04

INPUT FILE ? NY565

FLOOD HYDROGRAPH PACKAGE (HEC-1)

DAM SAFETY VERSION JULY 1978

LAST MODIFICATION 26 FEB 79

PAGE 0001

FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION JULY 1978
LAST MODIFICATION 26 FEB 79

1

PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS
1
RUNOFF HYDROGRAPH AT INFLOW
ROUTE HYDROGRAPH TO UFTLOW
ROUTE HYDROGRAPH TO A
RUNOFF HYDROGRAPH AT GATES
COMBINE 2 HYDROGRAPHS AT
ROUTE HYDROGRAPH TO 1
ROUTE HYDROGRAPH TO 2
ROUTE HYDROGRAPH TO 3
END OF NETWORK

FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION JULY 1978
LAST MODIFICATION 26 FEB 79

1

RUN DATE: 4/30/
TIME: 8:01 AM

ANALYSIS OF DAM OVERTOPPING USING RATIOS OF FMF
HYDROLOGIC-HYDRAULIC ANALYSIS OF SAFETY OF ISCHUA CREEK DAM NO. 5
RATIOS OF PMF ROUTED THROUGH THE RESERVOIR AND DOWNSTREAM

NO	NHR	NMIN	1DAY	1HR	IMIN	ME1RC	IPLT	IFRT	NSTAN
100	0	15	0	0	0	0	-1	4	0
			JOFER	NWT	LROP	TRACE			
			5	0	0	0			

MULTI-PLAN ANALYSES TO BE PERFORMED
R10SS= 0.20 NPLAN= 1 NRITC= 6 LRT10= 1
0.40 0.50 0.60 0.80 1.00

SUF-AREA RUNOFF COMPUTATION
CALCULATION OF INFLOW HYDROGRAPH TO RESERVOIR
ISAR ICOMP IECON ITAPE JPAT INARF ISTAGE IAUTO
INFLOW 0 0 0 0 0 0 0 0 0
IHNG TNG TERRA Snap IRSDA TSFC RATIO ISNOV ISAME LOCAL

BOOKS RECEIVED

PACIF 0062

PRECIP DATA
SPF E PMS R6 R12 R24 R48 R72 R96
0.00 22.50 117.00 127.00 141.00 151.00 0.00 0.00

	ROPT	STRKR	DLTKH	RTJOL	ERAIN	STRXS	RT10K	STRL	CNSTL	ALSPX	R11MP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.10	0.00	0.00

UNIT HYDROGRAPH DATA
 1 F= 3.49 CP=0.63 NIA= 0

SIRIUS = 2.00 RECESSSION DATA QRC SNE = 0.10 RIGORE = 2.00

UNIT	HYDROGRAPH	77	END-OF-PERIOD	ORDINATES,	LAG=	3.52	HOURS,	CP= 0.64	VOL= 1.00
4.	54.	111.	177.	259.	328.	409.	492.	492.	571.
1.	730.	756.	766.	760.	729.	678.	627.	580.	537.
6.	459.	425.	393.	363.	336.	311.	288.	266.	246.
8.	210.	195.	180.	167.	154.	142.	132.	122.	113.
4.	96.	89.	82.	76.	71.	65.	60.	56.	52.
6.	44.	41.	38.	35.	32.	30.	28.	26.	24.
2.	20.	19.	17.	16.	15.	14.	13.	12.	11.
0.	9.	8.	7.	7.	7.	7.	6.	6.	6.

HR.MN	PERIOD	RAIN	EXCS	LOSS	END-OF-PERIOD FLOW COMP. Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	CCMS Q
0					SUM	27.49	23.74				3.75	236826.
					(	658.0	(	603.0	(	95.0	(	9537.84

ELEVATION= 1739. 1752. 1772. 1781. 1787. 1789. 1790.
 CREL 1782.0 SPWID 0.0 COWD 0.0 FFLW 0.0 CGRL 0.0 CAREA 0.0 EXFL 0.0

DAM DATA
 TOPL 1789.2 COOD 2.7 EXPD 1.5 DAMID 1300.

PEAK OUTFLOW IS 1851. AT TIME 45.00 HOURS
 PEAK OUTFLOW IS 4953. AT TIME 43.50 HOURS
 PEAK OUTFLOW IS 6228. AT TIME 43.25 HOURS
 PEAK OUTFLOW IS 7494. AT TIME 43.25 HOURS
 PEAK OUTFLOW IS 10015. AT TIME 43.25 HOURS
 PEAK OUTFLOW IS 12515. AT TIME 43.25 HOURS

HYDROGRAPH ROUTING

CHANNEL ROUTING -MOD PULS RESERVOIR -A							
ISTAG	ICORP	IECON	ITAPE	JPLT	INATE	ISSTAGE	IATID
A	1	0	0	0	0	0	0
		ROUTING DATA					
GLOSS	CLOSS	Avg	IPRES	TOPT	IPMP	LSTR	
0.0	0.000	0.00	1	0	0	0	
NSTPS	NSTOL	LAG	APSKK	X	TSK	SITORA	ISFRAT
1	0	0	0.000	0.000	0.000	0.	0

NORMAL DEPTH CHANNEL ROUTING

GN(1)	GN(2)	GN(3)	ELNVI	ELMAX	RUNH	SEL
0.0830	0.0400	0.0400	1719.0	1780.0	1900.	0.00810

CROSS SECTION COORDINATES--STA,ELEV,STA,ELEV--FTC
 0.03 1783.00 156.00 1760.00 663.00 1725.00 667.50 1719.00 682.50 1715.00
 690.00 1725.00 1790.00 1760.00 2000.00 1780.00

STORAGE	0.00	2.66	6.62	23.97	61.60	120.41	195.71	295.68	421.33	561.67
	723.68	906.74	1169.75	1333.47	1566.63	1812.66	2064.42	2324.25	2592.17	2862.10
OUTFLOW	0.00	36.9	32	131.91	4302.67	1216P.47	2722.55	51410.70	64479.17	124035.50
	2726(1.44	366403.44	47P52.13	614321.88	78555.38	975625.88	11P4383.00	1411758.75	1657795.50	197238.75
STAFF	1719.00	1722.21	1725.42	1728.61	1731.84	1735.05	1738.26	1741.47	1744.68	1746.84

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1751.10	1754.31	1757.53	1760.74	1763.95	1767.16	1770.37	1773.58	1776.79	1781.00
FLOW	0.00	368.32	1315.91	4302.67	12168.47	27222.55	51410.70	86479.17	134035.50
	2726.61.44	366403.44	478322.13	619321.88	785555.38	975625.88	1104385.00	1411758.75	1657746.50
MAXIMUM STAGE IS	1726.8								
MAXIMUM STAGE IS	1728.9								
MAXIMUM STAGE IS	1729.4								
MAXIMUM STAGE IS	1729.9								
MAXIMUM STAGE IS	1731.0								
MAXIMUM STAGE IS	1731.9								

SUB-AREA RUNOFF COMPUTATION

COMPUTE GATES CREEK HYDROGRAPH			
GATES	ISTAG	ICOMP	IICON
1	1	0	0
HYDROGRAPH DATA			
IMYNG	TUNG	TAREA	SNAP
1	1	6.64	0.00
			13.04
			0.00
			0.000
			RATIO
			0.00
			ISNOW
			0
			ISAME
			1
			LCAL
			0

PRECIP DATA			
SPFE	PMS	R6	R12
0.00	22.50	114.00	124.00
		138.00	148.00
			148.00
			0.00
			0.00

PRECIP DATA

LOSS DATA			
LADPT	STRKR	DLTKR	R710L
G	0.00	0.00	1.00
			0.00
			1.00
			1.00
			1.00

UNIT HYDROGRAPH DATA

TF= 4.11 CP=0.63 NIA= 0

RECEDITION DATA

SIRIO= 2.00 QRCSE= -0.10 RTIOR= 2.00

UNIT HYDROGRAPH 90 END-OF-FEPIOD ORDINATES, LAG= 4.10 FOLRS, CP= 0.63 VOL= 1.00			
1.0.	38.	79.	127.
5.17.	585.	622.	650.
549.	514.	481.	451.
284.	266.	249.	238.
167.	146.	129.	121.
76.	71.	67.	62.
79.	77.	54.	52.
20.	19.	18.	17.
11.	10.	9.	8.

OK, SAY THE AUTHOR

PAGE FORTY-FIVE

COMBINE HYDROGEN BOMB

HYDROGRAPH ROUTING

CHANNEL ROUTING - MOD PULS		A-1										
1STAQ	ICOMP	IECON	ISCAPE	JPLT	JPRTR	INAPR	1STAGE	IAUTO	0	0	0	0
1	1	0	0	0	0	0	1	0	0	0	0	0
GLOSS	CLOSS	Avg	ROUTING DATA	TOFT	IPMP			LSTR				
0.0	0.000	0.00	1RES ISAME	1	0			0				
NSTPS	NSTDL	LAG	AMSKK	X	X	TSK	STORM	ISPRAT				
1	0	0	0.000	0.000	0.000	0.000	0.000	0.				

NORMAL DEFTY CHANNEL ROUTING

ON(1)	ON(2)	ON(3)	ELNVT	ELMAX	RLNTH	SEL
0.0400	0.0400	0.0400	1719.0	1780.0	200.0	0.00010

CROSS SECTION COORDINATES--STA. ELEV. STA. ELEV. STA.

	STORAGE	0.00 85.91	0.62 105.49	2.17 127.09	5.55 150.68	10.96 175.48	18.39 201.13	27.85 227.63	39.33 254.98	52.03 281.18	61.36 311.23
	OUTFLOW	0.00 395803.31	702.18 517127.75	5796.27 660939.75	12299.80 831776.25	28150.94 1042034.50	54277.51 1274395.75	92039.09 152801.75	143434.03 1805274.50	210144.22 2103896.00	243761.19 244793.50
	STAGE	1719.00 1751.10	1722.21 1754.31	1725.42 1757.53	1728.63 1760.74	1731.84 1763.95	1735.05 1767.16	1738.26 1770.37	1741.47 1773.58	1744.68 1776.79	1745.80 1781.00
	FLOW	0.00 195803.31	702.18 517127.75	5906.27 660939.75	12299.80 831776.25	28150.94 1042034.50	54277.51 1274395.75	92039.09 152801.75	143434.03 1805274.50	210144.22 2103896.00	243761.19 244793.50

MAXIMUM STAGE IS	1725.0
MAXIMUM STAGE IS	1727.6
MAXIMUM STAGE IS	1728.5
MAXIMUM STAGE IS	1729.0
MAXIMUM STAGE IS	1730.0
MAXIMUM STAGE IS	1730.9

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CHANNEL	ROUTING	-MOD	PULS	REACH 1-2								
ISTAQ	ICOMP	IECON	IIAPE	JPLI	JPRI	INAME	IStage	IAUTO				
2	1	0	0	0	0	1	0	0				
GLOSS	CLOSS	Avg	IRES	ROUTING DATA	IPFI	IPMP			LSTR			
0.0	0.000	0.00	1	1	0	0			0			
HSTPS	NSTDL	LAG	AMSKK	X		TSK						
1	0	0	0.000	0.000	0.000	0.000						

NORMAL DEPTH CHANNEL ROUTING

GN(1)	GN(2)	GN(3)	ELNVT	ELMAY	RLNTH	SEL
0.0-0.400	0.0-0.400	0.0-0.400	1705.0	1730.0	2100.	0.00660
0.0-0.400	0.0-0.400	0.0-0.400				

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HYDROGRAPHIC ROUTING

CHANNEL ROUTING -MOD PULS REACH 1-2						NAME	
ISIAQ	ICOMP	IECON	IIMPE	JPLT	JPRT	0	1
2	1	0	0	0	0	0	1
			ROUTING DATA				
GLOSS	CLOSS	Avg	IRTS	ISAME	IOPF1	IPMP	
0.0	0.000	0.00	1	1	0	0	
NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	
1	0	0	0.000	0.000	0.000	0.000	0.

卷之三

HYDROGRAPHIC ROUTING

CHANNEL ROUTING -MOD PULS REACH 1-2						NAME	
ISIAQ	ICOMP	IECON	IIMPE	JPLT	JPRT	0	1
2	1	0	0	0	0	0	1
			ROUTING DATA				
GLOSS	CLOSS	Avg	IRTS	ISAME	IOPF1	IPMP	
0.0	0.000	0.00	1	1	0	0	
NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	
1	0	0	0.000	0.000	0.000	0.000	0.

MAXIMUM STAGE IS 1715.4
 MAXIMUM STAGE IS 1716.2
 MAXIMUM STAGE IS 1717.6
 MAXIMUM STAGE IS 1718.8

HYDROGRAPH ROUTING

CHANNEL ROUTING -MOD PULS REACH 2-3					
ISTAO	ICOMP	IICON	ITAPE	JPLT	JPRI
3	1	0	0	0	0
ROUTING DATA					
OLOSS	CLOSS	Avg	IRES	ISAME	IPPP
0.0	0.000	0.00	1	1	0
LSIR					
NSIPS	NSTDL	LAG	AMSKK	X	TSK
1	0	0	0.000	0.000	SEL
ISPRAT					
				0.	0.

NORMAL DEPTH CHANNEL ROUTING

QN(1)	QN(2)	QN(3)	FLNWT	ELMAX	RLNTH	SEL
0.0400	0.0400	0.0400	1683.0	1720.0	3600.	0.000610

CROSS SECTION COORDINATES--STA ELEV--STA ELEV--ETC
 0.00 1720.00 100.00 1700.00 655.00 1688.00 697.50 1683.00 712.50 1683.00
 755.00 1688.00 1050.00 1700.00 1500.00 1720.00

STORAGE	0.00	5.08	15.48	32.79	69.58	128.56	209.75	313.13	438.70	581.98
	745.50	913.64	1090.39	1275.77	1469.76	1672.36	1883.59	2103.43	2331.89	2561.97
OUTFLOW	0.00	209.76	948.04	2625.51	6215.86	12640.38	22761.54	37332.99	57042.88	83351.19
	118160.75	158896.09	205586.69	258256.66	316956.88	381756.50	452737.31	529899.63	613611.88	713706.38
STAGE	1683.30	1684.95	1686.89	1688.84	1690.79	1692.74	1694.68	1696.63	1698.58	1700.53
	1702.47	1704.42	1706.37	1708.31	1710.26	1712.21	1714.16	1716.10	1718.05	1720.00
FLOW	0.00	209.76	948.04	2625.51	6215.86	12640.38	22761.54	37332.99	57042.88	83396.19
	118160.75	158896.09	205586.69	258256.66	316956.88	381756.50	452737.31	529899.63	613611.88	713706.38
MAXIMUM STAGE IS	1689.5									
MAXIMUM STAGE IS	1691.0									
MAXIMUM STAGE IS	1692.5									
MAXIMUM STAGE IS	1693.1									

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MAXIMUM STAGE IS 1694.0
MAXIMUM STAGE IS 1694.6

PAGE 0008

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIO 1	RATIO 2	RATIO 3	RATIO 4	RATIO 5	RATIO 6
			0.20	0.40	0.50	0.60	0.80	1.00	1.00
HYDROGRAPH AT INFLOW	6.40 (16.58)	1 (71.34) (142.68)	2519. (5039. (6298. (7558. (10077. (12597. (
ROUTED TO INFLOW	6.40 (16.58)	1 (52.41) (140.24) (176.37) (212.21) (283.58) (356.76 ) (	1851. (4953. (6228. (7494. (10015. (12515. (
ROUTED TO A (16.58)	6.40 (52.26)	1 (52.26) (140.32) (176.19) (211.94) (283.32) (354.18 ) (	1845. (4955. (6222. (7485. (10006. (12508. (
HYDROGRAPH AT GATES	6.64 (17.20)	1 (64.71) (129.42) (161.78) (194.13) (258.84) (323.55 ) (	2285. (4570. (5713. (6856. (9101. (11426. (
2 COMBINED (33.77)	13.04 (107.72)	1 (107.72) (269.74) (337.96) (405.82) (541.31) (676.58 ) (	3804. (9526. (11935. (14331. (19116. (23893. (
ROUTED TO (33.77)	13.04 (107.68)	1 (107.68) (269.87) (338.08) (405.90) (541.36) (676.57 ) (	3803. (9536. (11939. (14334. (19118. (23893. (
ROUTED TO (33.77)	13.04 (107.84)	1 (107.84) (269.75) (338.01) (405.93) (541.55) (676.81 ) (	3808. (9526. (11937. (14335. (19125. (23901. (
ROUTED TO (33.77)	13.04 (107.34)	1 (107.34) (269.09) (337.22) (405.47) (541.16) (676.62 ) (	3791. (9503. (11909. (14319. (19111. (23895. (

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1	ELEVATION	INITIAL VALUE	SPILLWAY CREST	TOF OF DAM
	STORAGE OUTFLOW	1772.00 470. 64.	1782.00 1029. 328.	1789.20 1643. 22137.

PLAN	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	CURATION OVER TOP HOURS	TIME OF MAX OUTFLW HOURS	TIME OF FAILURE HOURS
1	1783.21	0.00	1117.	1451.	45.00	0.00
2	1784.56	5.00	1217.	4953.	43.59	0.00

D-12

0.50	1785.04	0.00	1252.	6228.	0.00	43.25	0.00
0.60	1785.45	0.00	1282.	7494.	0.00	43.25	0.00
0.80	1786.22	0.00	1338.	10015.	0.00	43.25	0.00
1.00	1786.92	0.00	1389.	12515.	0.00	43.25	0.00

PLAN 1 STATION A

RATIO	MAXIMUM FLOW CFS	STAGE FT	TIME HOURS
0.20	1845.	1726.0	45.00
0.40	4955.	1728.9	43.50
0.50	6222.	1729.4	43.50
0.60	7485.	1729.9	43.25
0.80	10006.	1731.0	43.25
1.00	12508.	1731.9	43.25

PLAN 1 STATION 1

RATIO	MAXIMUM FLOW CFS	STAGE FT	TIME HOURS
0.20	3803.	1725.3	44.75
0.50	11939.	1728.5	43.50
0.60	14334.	1729.0	43.50
0.80	19118.	1730.0	43.50
1.00	25893.	1730.9	43.50

PLAN 1 STATION 2

RATIO	MAXIMUM FLOW CFS	STAGE FT	TIME HOURS
0.20	3808.	1711.6	45.00
0.40	9526.	1714.5	43.50
0.50	11937.	1715.4	43.50
0.60	14335.	1716.2	43.50
0.80	19125.	1717.6	43.50
1.00	25891.	1718.8	43.50

PLAN 1 STATION 3

RATIO	MAXIMUM FLOW CFS	STAGE FT	TIME HOURS
0.20	3791.	1689.5	45.00
0.40	9503.	1691.8	43.75
0.50	11909.	1692.5	43.50
0.60	14319.	1693.1	43.50
0.80	19111.	1694.0	43.50
1.00	25895.	1694.8	43.50

P.R.P. DATE 3/17/81 ERDMAN, ANTHONY, ASSOCIATES SHEET 1 OF 18
 EXD B.R. DATE 3/17/81 SUBJECT DAM 565 HYDROLOGY SUB-SHEET NO. 1
 OWNER PROJECT NAME HEC-1 DB DAM INSPECTION 80166-00-06

DAM 565 ISCHUA CREEK DAM #5

REF. QUAD. FRANKINVILLE N.Y.
 RAWSON N.Y.

DRAINAGE DISTANCE

DISTANCE L & L_{ca} MEAS. WITH A MAP MEASURING WHEEL (1" = 2000')

COMPUTATIONS FOR L DISTANCE

RUN	MEAS. DIST.	Avg. DIST.	COEF.	L- DISTANCE
A	1 = 8.8"			
	2 = <u>8.7</u> "			
		$17.5 \div 2 = 8.75"$	$\times 2000'$	= 17500 FT. *

B	1 = 8.65"			
	2 = <u>8.75</u> "			
		$17.40 \div 2 = 8.7"$	$\times 2000'$	= 17400 FT.

C	1 = 7.95"			
	2 = <u>7.90</u> "			
		$15.85 \div 2 = 7.93"$	$\times 2000'$	= 15860 FT

D	1 = 7.9"			
	2 = <u>7.8</u> "			
		$15.7 \div 2 = 7.85"$	$\times 2000'$	= 15700 FT.

E	1 = 7.2"			
	2 = <u>7.3</u> "			
		$14.5 \div 2 = 7.25$	$\times 2000'$	= 14500 FT.

* L = 17500 FT (USED RUN A)

COMPUTATIONS FOR L_{ca} DISTANCE

RUN				
A	1 = 4.65"			
	2 = <u>4.65</u> "			
		$9.30 \div 2 = 4.65"$	$\times 2000'$	= 9300 FT.

L_{ca} = 9300 FT

BY P.I.T. DATE 4/20/81 ERDMAN, ANTHONY, ASSOCIATES SHEET 2 OF 18
 C) B.R. DATE 4/23/81 SUBJECT DAM 565 HYDROLOGY SUB-SHEET NO. 2
 OWNER PROJECT NAME HEC-1 DB DAM INSPECTION 80166-00-06

DAM 565 ISCHUA CREEK DAM #5

REF. QUADS

[GATES CREEK]
[WATERSHED]

RAWSON, NY

FRANKLINVILLE, NY

DISTANCE FOR L & LCA MEASUREMENT WITH MAP MEASURING WHEEL ($1' = 2000'$)

COMPUTATION FOR L DISTANCE

RUN	MEAS. DIST.	Avg. DIST.	COEF.	L DISTANCE
A	1 = 10.3			
	2 = <u>10.2</u>	$20.5 \div 2 = 10.25$	$\times 2000'$	= 20,500 FT.
B	1 = 10.85			
	2 = <u>.10.85</u>	$21.70 \div 2 = 10.85$	$\times 2000'$	= 21,700 FT.
C	1 = 11.26			
	2 = <u>11.25</u>	$22.45 \div 2 = 11.23$	$\times 2000'$	= * <u>22,460 FT.</u>

* L = 22,460 FT (USED RUN C)

COMPUTATION FOR LCA DISTANCE

RUN	MEAS. DIST	Avg DIST	COEF.	LCA DISTANCE
C	1 = 6.5			
	2 = <u>6.5</u>	$13.0 \div 2 = 6.5$	$\times 2000'$	= * <u>13,000 FT</u>

* Lca = 13,000 FT.

BY B.R. DATE 3/17/81 ERDMAN, ANTHONY, ASSOCIATES SHEET 3 OF 18
 C, 91PA DATE 3/17/81 SUBJECT DAM 565 HYDROLOGY SUB-SHEET NO. 3
 OWNER PROJECT NAME ISCHUA CREEK #5 (80166-00-06)

$$\tau_p = c_r (L L_{ca})^{0.3}$$

$$c_r = 2.00$$

$$\tau_r = \frac{\tau_p}{5.5}$$

$$c_p = 0.63$$

$$\tau_{pr} = \tau_p + 0.25 (\tau_r - \tau_p)$$

$$L = 17500 \text{ ft} = 3.31 \text{ mi}$$

$$L_{ca} = 9300 \text{ ft} = 1.76 \text{ mi}$$

$$\tau_p = 2(3.31 \times 1.76)^{0.3} = 3.39 \text{ hr.}$$

$$\tau_r = \frac{3.39}{5.5} = 0.62 \text{ hr.} \implies \tau_r = 1.00 \text{ hr.}$$

$$\tau_{pr} = 3.39 + 0.25 (1.00 - 0.62) = 3.49 \text{ hr}$$

BY R.R. DATE 4/24/81 ERDMAN, ANTHONY, ASSOCIATES SHEET 4 OF 18
 OWNER DNR DATE 4/27/81 SUBJECT DAM 565, HYDROLOGY SUB-SHEET NO. 4
 PROJECT NAME DAM INSPECTION 80166-00-06

GATES CREEK WATERSHED

gate creek watershed area = 46.3 in² on scale 1/24000

$$= 46.3 \times 24000^2 \text{ in}^2$$

$$= \frac{46.3 \times 24000^2 \text{ in}^2}{12^2 \frac{\text{in}^2}{\text{ft}^2} \times 27878400 \frac{\text{ft}^2}{\text{mile}^2}} = 6.64 \text{ mile}^2 \checkmark$$

TRSDA for M card :

$$\text{TRSDA} = 6.64 + 6.4 = 13.04 \text{ mile}^2 \checkmark$$

PMS for P card

T B.R. DATE 4/23/81 ERDMAN, ANTHONY, ASSOCIATES SHEET 5 OF 18
 D G.R.A. DATE 4/27/81 SUBJECT DAM 565 HYDROLOGY SUB-SHEET NO. 5
 OWNER PROJECT NAME GATES GREEK B0166-00-06

$$\tau_p = c_t (L L_{ca})^{0.3}$$

$$\tau_r = \frac{\tau_p}{5.5}$$

$$c_t = 2.0$$

$$c_p = 0.63$$

$$\tau_{pr} = \tau_p + 0.25 (\tau_r - \tau_p)$$

$$L = 22,460 \text{ ft} = \frac{22460}{5280} = 4.25 \text{ MILE } \checkmark$$

$$L_{ca} = 13,000 \text{ ft} = \frac{13000}{5280} = 2.46 \text{ MILE } \checkmark$$

$$\tau_p = 2 (4.25 \times 2.46)^{0.3} = 4.04 \text{ hr. } \checkmark$$

$$\tau_r = \frac{4.04}{5.5} = 0.73 \text{ hr. } \checkmark \implies \tau_r = 1.00 \text{ hr. } \checkmark$$

$$\tau_{pr} = 4.04 + 0.25 (1 - 0.73) = 4.11 \text{ hr. } \checkmark$$

S.R. DATE 3/25/61
 OWNER DATE 9/1/61

ERDMAN, ANTHONY, ASSOCIATES
 SUBJECT DAM 565 - HYDRAULICS
 PROJECT NAME DAM INSPECTIONS

SHEET 6 OF 13

SUB-SHEET NO. 1

(80166-00.06)

DAM 565 HYDRAULICS

SERVICE SPILLWAY

4' or 48" ϕ RCP ✓ w/ 12" x 4" RISER ✓

FROM DESIGN REPORT : $Q_s = 305 \text{ cfs} @ \text{ELEV. } 1780.6$

$Q_s = 0 \text{ cfs} @ \text{ELEV. } 1772$
 (Ignore 24" x 18" orifice in river)

$$Q_s = C_o A_o \sqrt{2g H_o}$$

$$A_o = 4\pi \text{ ft}^2$$

note: the cross sectional area of RCP is assumed to control.

$$H = 1780.6 - 1772 = 8.6'$$

$$C_o = \frac{Q_s}{A_o \sqrt{2g H_o}} = \frac{305}{4\pi \sqrt{2 \times 32.2 \times 8.6}} = 1.03 \checkmark$$

SERVICE SPILLWAY		
ELEV.	H _o	Q _s
1772	0	
1775		
1778		
1780.6	8.6	305 ✓
1781	9.0	312 ✓
1782	10	328 ✓
1783	11	345 ✓
1784	12	360 ✓
1785	13	375 ✓
1786	14	389 ✓
1787	15	402 ✓
1788	16	415 ✓
1789	17	428 ✓
1790.2	17.2	431 ✓

For elevation higher than the crest of riser.

$$Q_s = 1.03 \times 4\pi \sqrt{2g} H_o^{\frac{1}{2}}$$

$$Q_s = 103.87 H_o^{\frac{1}{2}} \checkmark$$

ELEV.	H _o	Q _s
1790	18	441 ✓
1791	19	453 ✓
1792	20	465 ✓

BY B.R. DATE 3/26/91
OWNER D.O.R.A. DATE 9/1/91

ERDMAN, ANTHONY, ASSOCIATES

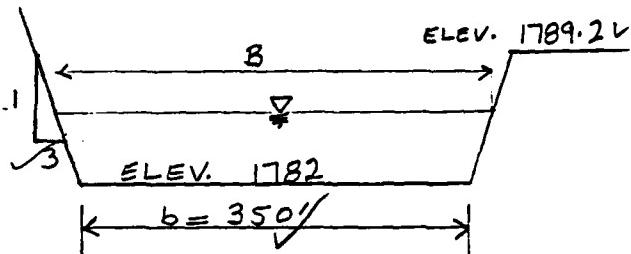
SUBJECT DAM 565 HYDRAULICS

PROJECT NAME DAM INSPECTION (B0166-00-06)

SHEET 1 OF 10

SUB-SHEET NO. 2

EMERGENCY SPILLWAY



EMERGENCY SPILWAY SECTION

For $y = 1'$

$s = 0.05 \checkmark$

$$B = (2 \times 3) + 350 = 356' \checkmark$$

$$A = \frac{1}{2} (356 + 350)(1) = 353' - ft^2$$

$$Q_c = \sqrt{\frac{32.2 (353)^3}{356}} = 1995 cfs \checkmark$$

$$K = \frac{1.49}{n} AR^{2/3} = \frac{1.49}{0.035} (.353) \left[\frac{353}{350 + 2(1+9)^{0.5}} \right]^{2/3}$$

$$K = 14934.1$$

$$S_c = \left(\frac{Q_c}{K} \right)^2 = \left(\frac{1995}{14934.1} \right)^2 = 0.018 \checkmark$$

spillway slope > critical slope

$$0.05 > 0.018$$

∴ Flow goes through critical depth for $y = 1'$ and also for $y > 1'$. Use Table 8-7 from "King & Brater"

BY F.R.P. DATE 3/22/81
S.B. B.R. DATE 4/1/81

ERDMAN, ANTHONY, ASSOCIATES

SUBJECT DAM 565 RESERVOIR AREA SUB-SHEET NO. 3
PROJECT NAME HEC-1 DAM INSPECTION

SHEET 8 OF 18

OWNER

8016-00-06

ISCHUA CREEK DAM #5

\$A RAREA RESERVOIR SURFACE AREA IN ACRES

\$E RELEV RESERVOIR ELEVATIONS IN FEET

REF. U.S. DEPT. OF A.S.C.A. AS BUILT PLAN DWG. NY-805-P

SCALE 1" = 200' X 1/2 REDUCTION = 1" = 400'

$$\text{Eq. } \frac{\text{in}^2}{\text{in}^2} \times \frac{400^2 \text{ft}^2}{\text{in}^2} \times \frac{1 \text{AC}}{43560 \text{ft}^2} = \text{AC.}$$

ELEV 1752. = 6.5 AC. GIVEN

$$1760 = 5.35 \frac{\text{in}^2}{\text{in}^2} \times \frac{400^2 \text{ft}^2}{\text{in}^2} \times \frac{1 \text{AC}}{43560 \text{ft}^2} = \underline{19.65 \text{ AC.}}$$

$$1770 = 10.28 \frac{\text{in}^2}{\text{in}^2} \times \frac{400^2 \text{ft}^2}{\text{in}^2} \times \frac{1 \text{AC}}{43560 \text{ft}^2} = \underline{37.76 \text{ AC.}}$$

1772 = 42.0 AC GIVEN

1780.6 = 70.0 AC GIVEN

$$1785 = 23.37 \frac{\text{in}^2}{\text{in}^2} \times \frac{400^2 \text{ft}^2}{\text{in}^2} \times \frac{1 \text{AC}}{43560 \text{ft}^2} = 65.84 \text{ AC.}$$

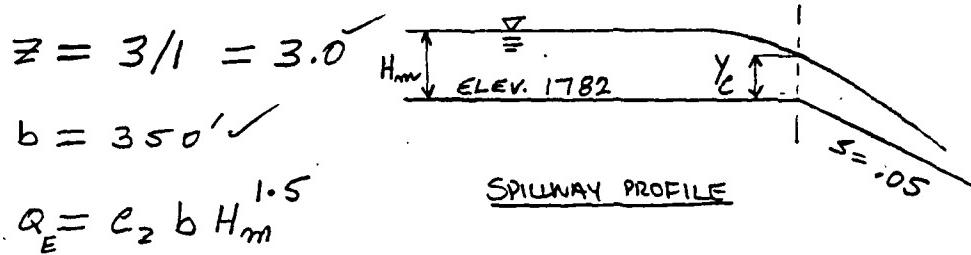
$$1790 = 27.46 \frac{\text{in}^2}{\text{in}^2} \times \frac{400^2 \text{ft}^2}{\text{in}^2} \times \frac{1 \text{AC}}{43560 \text{ft}^2} = \underline{100.86 \text{ AC.}}$$

Used storage-elevation relationship from SCI design report for the computer model.

BY B.R. DATE 3/26/81
 CKD XRA DATE 9/1/91 OWNER

ERDMAN, ANTHONY, ASSOCIATES SUBJECT DAM 565 HYDRAULICS PROJECT NAME DAM INSPECTION (B0166-00-06)
 SUB-SHEET NO. 4

SHEET 9 OF 18



EMERGENCY SPILLWAY, Q-ELEV. RELATIONSHIP

H_m	$\frac{H_m Z}{b}$	C_2	Q_E	ELEV.	H_m	$\frac{H_m Z}{b}$	C_2	Q_E	ELEV.
0.0	0	3.09	0	1782	8	0.07	3.23	25580	1790
1	0.01	3.11	1089	1783	9	0.08	3.25	30713	1791
2	0.02	3.13	3099	1784	10	0.09	3.27	36192	1792
3	0.03	3.15	5729	1785					
4	0.03	3.15	8820	1786					
5	0.04	3.17	12105	1787					
6	0.05	3.19	16409	1788					
7	0.06	3.21	20808	1789					
7.2	0.06	3.21	21706	1789.2					

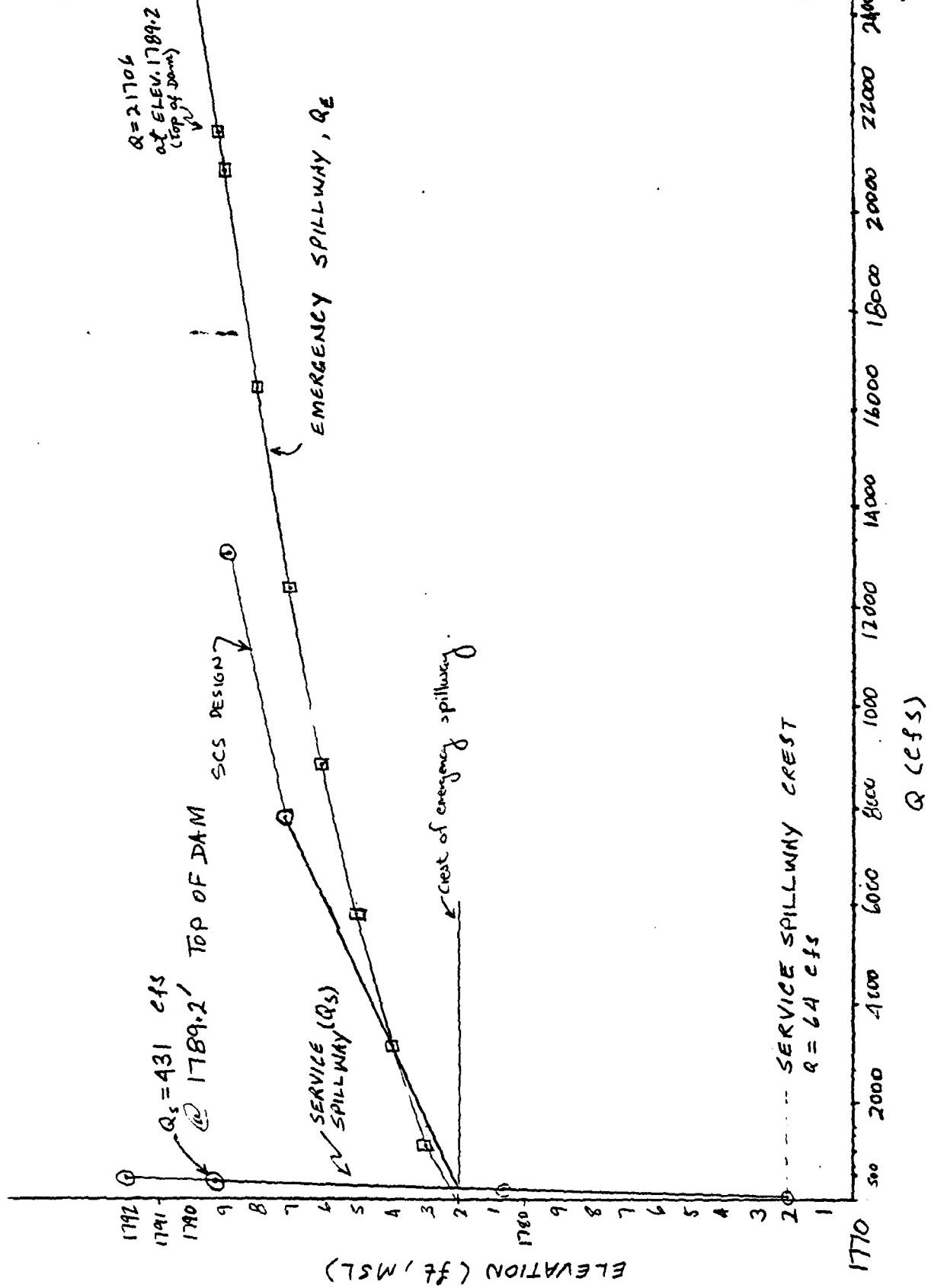
TOTAL SPILLWAYS DISCHARGE

ELEV.	$Q_S + Q_E$	RESERVOIR SURFACE AREA
1772	0.64	42.0
1775	0.145	
1778	0.270	
1780.6	3.05	70.0
1781	3.12	
1782	3.28	
1783	14.34	
1784	34.59	
1785	61.04	85.84
1786	92.09	
1787	128.07	
1788	168.24	
1789	212.36	
** 1789.2	221.37	
1790	260.21	100.86

ELEV.	$Q_S + Q_E$	RESERVOIR SURFACE AREA
1791	311.66	
1792	366.57	

BY B.R. DATE 3/26/81 ERDMAN, ANTHONY, ASSOCIATES SHEET 10 OF 19
 D KRA DATE 4/1/81 SUBJECT DAM 565 HYDRAULICS SUB-SHEET NO. 5
 OWNER PROJECT NAME DAM INSPECTIONS (B0166-00-06)

SPILLWAY RATING CURVE - DAM 565



BY B.R. DATE 3/30/81 ERDMAN, ANTHONY, ASSOCIATES SHEET 11 OF 19
KD 910A DATE 4/1/81 SUBJECT DAM 565-HYDRAULICS SUB-SHEET NO. 6
OWNER PROJECT NAME DAM INSPECTIONS 80166-00-06

VALUES ON \$D CARD OF HEC-1 PROGRAM

<u>FIELD</u>	<u>VARIABLE</u>	<u>VALUE</u>
0	ID	\$D
1	TOPEL	1789.2 ✓
2	CQD	2.7 ✓
3	EXPD	1.5 ✓
4	DAMWID	1300 ✓

Y 11/17 DATE 4/23/81
 ID 92A DATE 5/1/81 SUBJECT T-2.11 5.5 - Hydro. Services
 OWNER PROJECT NAME T-2.11 INSPECTIONS (20166-10106)
 SHEET 12 OF 18
 SUB-SHEET NO. 7

Un gated Spillway Capacity @ 1786.9

E10/ Q

Principal	1786.0	389 ✓
	1787.0	402 ✓
Emergency	1786.0	8820
	1787.0	12,405

Emergency

$$(.4)(12,405 - 8820) + 8820 = 12,047 \text{ cfs}$$

Principal

$$(9)(402 - 389) + 389 = 401 \text{ cfs} \checkmark$$

$$Q_{\text{Total}} @ 1786.9 = 12,515 \text{ cfs} \quad (\text{from computer output})$$

$$\begin{array}{r}
 - Q_{\text{Service}} @ 1786.9 \\
 \hline
 Q_{\bar{c}s} @ 1786.9
 \end{array}
 \quad 401 \text{ cfs}$$

Y DATE ERDMAN, ANTHONY, ASSOCIATES SHEET 13 OF 18
 KD 9-2A DATE 5/1/81 SUBJECT D-1 SET - 4 Lateralis SUB-SHEET NO. 8
 OWNER PROJECT NAME D-1 INSPECTION (01) (180111-21.03)

ECL	Reservoir Surface Area
1785	85.84 ✓
17-0	100.86 ✓

Reservoir SA @ 1786.9

$$\frac{5}{15.02} = \frac{1.9}{x} \quad x = 5.71 \text{ ft} \checkmark$$

$$SA = 85.84 + 5.71 = 91.55 \text{ ft}^2 \checkmark$$

Reservoir SH @ 1789.2

$$\frac{5}{15.02} = \frac{4.2}{x} \quad x = 12.62 \checkmark$$

$$SH = 85.84 + 12.62 = 98.46 \text{ ft}^2 \checkmark$$

Y : 11/12 DATE 11/20/81 ERDMAN, ANTHONY, ASSOCIATES SHEET 14 OF 18
 JKD X RFA DATE 5/11/81 SUBJECT DAM SIGS - Hydraulics SUB-SHEET NO. 9
 OWNER PROJECT NAME Dam Inspections (80166-00.06)

Emergency Seepage Velocities

Flood	<u>Q_{total}</u>	<u>ELE1</u>	<u>Q_{es}</u>	<u>A</u>	<u>V</u>	<u>Comments</u>
PLF	12515-	1786.92 ✓	12,114 ✓	1077 ✓	11.2 ✓	> 8 ft/sec ∵ erosion
½ PLF	6228 ✓	1785.04 ✓	5853	690	8.5	> 8 ft/sec ∵ erosion

PMF

$$\text{Assume } y_n/b < 0.02 \Rightarrow y_n = 0.789 \left(\frac{Q_n}{b S_0^{0.5}} \right)^{0.6}$$

$$y_n = 0.789 \left(\frac{12,114 (0.06)}{350 (0.05)^{0.5}} \right)^{0.6} = 3.00 \checkmark \quad y_n/b = \frac{3.00}{350} = 0.008 < 0.02 \text{ OK}$$

$$A = (3.0)(350') + \frac{1}{2} (\frac{1}{2} (3.0)(9.0)) = 1077 \text{ ft}^2 \checkmark$$

$$V = \frac{Q}{A} = \frac{12,114}{1077} = 11.2 \text{ ft/sec.}$$

½ PMF

$$6228 \text{ cfs} - 375 \text{ cfs} = 5853 \text{ cfs} \checkmark$$

$$\text{Assume } y_n/b < 0.02 \Rightarrow y_n = 0.789 \left(\frac{Q_n}{b S_0^{0.5}} \right)^{0.6}$$

$$y_n = 0.789 \left(\frac{5853 (0.06)}{350 (0.05)^{0.5}} \right)^{0.6} = 1.94 \checkmark \quad y_n/b = \frac{1.94}{350} = 0.005 < 0.02 \text{ OK}$$

$$A = (1.94')(350') + \frac{1}{2} (\frac{1}{2} (1.94)(30)(1.94')) = 690 \text{ ft}^2 \checkmark$$

$$V = \frac{Q}{A} = \frac{5853}{690} = 8.5 \text{ ft/sec.} \checkmark$$

YKJ DATE 4/29/81 ERDMAN, ANTHONY, ASSOCIATES SHEET 15 OF 18
 KWY DATE 5/11/81 SUBJECT DAM 565 - HYDRAULICS SUB-SHEET NO. 10
 OWNER PROJECT NAME DAM INSPECTIONS (E0166-00.06)

Stage vs. Storage Relationship

Instead of a surface area vs. elevation relationship developed on sub-sheet 3, the storage vs. elevation relationship provided by SCS in the design report will be used.

<u>Elevation</u>	<u>Storage</u>
1739	0'
1752	45'
1772	470'
1780.6	926'
1787.2	1410'
1788.9	1616'
1790	1716 - extrapolated value

P.R.P DATE 3/22/81

ERDMAN, ANTHONY, ASSOCIATES

SHEET 16 OF 18

G.R. DATE 3/24/81 SUBJECT DAM 565 ROUTING

SUB-SHEET NO. 1

OWNER

PROJECT NAME DAM INSPECTION

80166-00-06

B.R. 4/13/81
9RA 4/13/81

ISCHUA CREEK DAM 5

DAM DATA FROM AS-BUILT PLAN

$$\text{DAM TOP ELEV.} = 1790.1 \quad \boxed{\frac{1780}{0}, \frac{1760}{150}, \frac{1725}{660}, \frac{1719}{667.5}, \frac{1719}{682.5}, \frac{1725}{690}, \frac{1760}{1790}, \frac{178.}{200}}$$

$$\text{DAM INV. ELEV.} = 1736.$$

REACH 1 LENGTH = 2100'

Y6 - 6COL

CROSS SECT. $\frac{1730}{0}$ $\frac{1760}{150}$ $\frac{1740}{400}$ $\frac{1719}{670}$ $\frac{1719}{680}$ $\frac{1740}{1500}$ $\frac{1766}{1790}$ $\frac{1780}{2000}$

Y7 1-10

SLOPE: DAM INV. - REACH 1 INV. = $h \div L = \text{SLOPE}$

$$1736. - 1719 = 17 \div 2100 = 0.0081$$

Y6 - 7COL

REACH 2 LENGTH = 2100' $\boxed{\frac{1730}{0}, \frac{1720}{675}, \frac{1710}{800}, \frac{1705}{842.5}, \frac{1705}{857.5}, \frac{1710}{900}, \frac{1720}{960}, \frac{1730}{1100}}$ CROSS SECT. $\frac{1730}{0}$ $\frac{1720}{675}$ $\frac{1705}{805}$ $\frac{1705}{895}$ $\frac{1720}{960}$ $\frac{1730}{1100}$ SLOPE: REACH 1 INV. - REACH 2 INV. = $h \div L = \text{SLOPE}$

$$1719 - 1705 = 14 \div 2100 = 0.0066$$

✓

REACH 3 LENGTH = 3600' $\boxed{\frac{1720}{0}, \frac{1700}{100}, \frac{1688}{655}, \frac{1683}{697.5}, \frac{1683}{712.5}, \frac{1688}{755}, \frac{1700}{1050}, \frac{1720}{1500}}$ CROSS SECT. $\frac{1720}{0}$ $\frac{1700}{100}$ $\frac{1688}{700}$ $\frac{1683}{710}$ $\frac{1700}{1050}$ $\frac{1720}{1500}$ SLOPE: REACH 2 INV. - REACH 1 INV. = $h \div L = \text{SLOPE}$

$$1705 - 1683 = 2.2 \div 3600 = 0.00061$$

REACH 4 LENGTH = 6700'

CROSS SECT. $\frac{1700}{0}$ $\frac{1660}{500}$ $\frac{1639}{1250}$ $\frac{1639}{1260}$ $\frac{1660}{1600}$ $\frac{1700}{1700}$ NOT BEEN
USED(REACHES
4, 5, 6, 7, 8)SLOPE: REACH 3 INV. - REACH 4 INV. = $h \div L = \text{SLOPE}$

$$1683 - 1639 = 44 \div 6700 = 0.00066$$

REACH 5 LENGTH = 5400'

CROSS SECT. $\frac{1640}{0}$ $\frac{1620}{75}$ $\frac{1600}{100}$ $\frac{1598}{120}$ $\frac{1598}{130}$ $\frac{1600}{225}$ $\frac{1620}{1300}$ $\frac{1640}{1350}$ SLOPE: REACH 4 INV. - REACH 5 INV. = $h \div L = \text{SLOPE}$

$$1639 - 1598 = 41 \div 5400 = 0.00076$$

CONTINUED ON SHEET 2

P.R.P	DATE 3/23/81	ERDMAN, ANTHONY, ASSOCIATES	SHEET 17 OF 18
CKD	R.R. DATE 3/24/81	SUBJECT DAM 565 ROUTING	SUB-SHEET NO. 2
OWNER	PROJECT NAME DAM INSPECTION		80166-00-06

ISCHUA CREEK DAM 5

REACH 6 LENGTH = 2000'

CROSS SECT. 1585 1580 1579 1579 1580 1585
 $\frac{8}{0}$ 15 50 60 110 1050

SLOPE: REACH 5 INV. - REACH 6 INV. = $h \div L = \text{SLOPE}$

$$1598 - 1579 = 19' \div 2000' = 0.0095 \quad \checkmark$$

REACH 7 LENGTH = 1600'

CROSS SECT. 1535 1580 1570 1570 1580 1585
 $\frac{8}{0}$ 75 150 160 200 400

SLOPE: REACH 6 INV. - REACH 7 INV. = $h \div L = \text{SLOPE}$.

$$1579 - 1570 = 9' \div 1600' = 0.0056 \quad \checkmark$$

REACH 8 LENGTH = 3800'

CROSS SECT. 1580 1560 1560 1563 1559 1559 1560 1580
 $\frac{0}{0}$ 75 100 150 205 250 275 1475

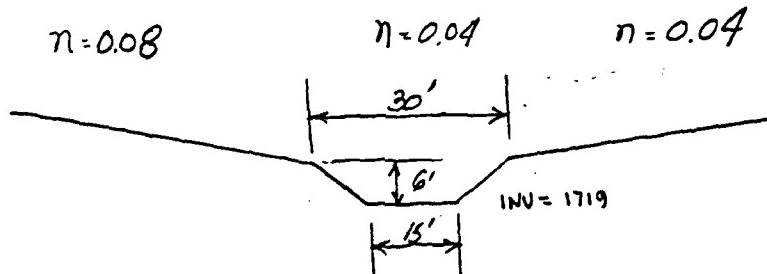
SLOPE: REACH 7 INV. - REACH 8 INV. = $h \div L = \text{SLOPE}$.

$$1570 - 1559 = 11' \div 3800' = 0.0029 \quad \checkmark$$

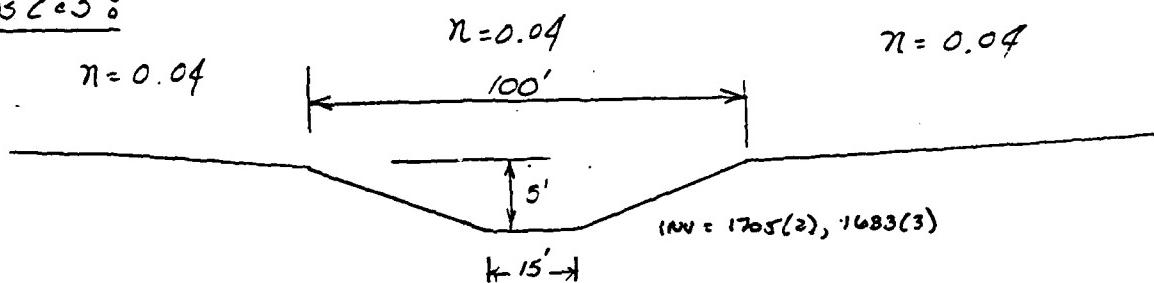
- 97RA DATE 4/13/81 ERDMAN, ANTHONY, ASSOCIATES SHEET 18 OF 18
 KD D.R. DATE 4/13/81 SUBJECT DAM 565 - CHANNEL SECTIONS SUB-SHEET NO. 1
 OWNER PROJECT NAME DAM INSPECTIONS (E0166-00-06)

DAM 565 - CHANNEL SECTIONS

SECTION 1:



SECTIONS 2 & 3:



APPENDIX E

INFORMATION AS CONTAINED IN
THE NATIONAL INVENTORY OF DAMS

AD-A105 800 ERDMAN ANTHONY ASSOCIATES ROCHESTER NY
NATIONAL DAM SAFETY PROGRAM, ISCHUA CREEK WATERSHED DAM NUMBER --ETC(U)
AUG 81 R J FARRELL

F/6 13/13

DACW51-81-C-0017

NL

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PAGE 126

NOTATIONAL OF EMERGENCY AND PRINCIPAL STREETS

REMARK 1-10-25-29A0

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→ EMERGENCY SPILLWAY; PRINCIPAL SPILLWAY IS 48' IN. CONVEX AND 4' x 12' RISER